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Basic Buying Stirs Market

And Some of the Lethargy Disappears—Hope of Early Rate Decision May Not Prove Well Founded

More cheerful sentiment continues to assert itself in the iron market. This is due, in part, to external conditions which promise to affect all business favorably. The prospects of splendid crops and the promise that there will be no radical legislation in Washington this summer, are among the encouraging conditions of a general character. Within itself, also, the market has a better tone. The buying of 80,000 tons of basic pig iron in the east and additional purchases by Canton, O., and St. Louis melters, have given reason for hoping that more general buying will soon be started. It is true, however, that the prices at which basic has recently been purchased are believed to be low, but price concessions are common in a period of increasing activity following profound dullness, and such concessions are usually followed by a stronger market. The purchases of the United Steel Co., Canton, recently made, now amount to 40,000 tons. The Lukens Iron & Steel Co. was the heaviest buyer in the east, as it took about 50,000 tons from five different makers. The Central Iron & Steel Co., Harrisburg, purchased 18,000 tons, while the Harrisburg Pipe & Pipe Bending Co. bought 12,000 tons for third quarter and will probably take 12,000 tons additional. Most, if not all, of the iron bought by Pennsylvania melters was at $14, delivered. The awarding of 80,000 tons of iron segments for the East River tunnel, on which bids will be received Friday, is of considerable interest to foundries in the eastern territory:

Sheets and Tin Plate

The American Sheet & Tin Plate Co. has been awarded 600,000 boxes of tin plate by the Standard Oil Co., in competition with Welsh mills. The sheet market shows some improvement at Pittsburgh, but prices are sagging at Chicago. Chicago prices with freight from Pittsburgh deducted do not, however, represent Pittsburgh prices, as they usually do in times of greater prosperity. Some Ohio sheet mills are selling as low as 1.80c at their plants for No. 28 black, which is said to be cost price for those mills.

Railroad Buying

Rumors continue to be circulated that the decision of the Interstate Commerce Commission on the railroad rate advance will be announced within a few days and the prospect of an early decision has caused more optimistic feeling in some quarters. No official announcement has been made to justify any expectation of the decision being announced until shortly before the Commission adjourns for the summer vacation, but Judge Harlan's announcement some weeks ago clearly indicated that the Commission would not adjourn for vacation without making a decision. The St. Paul and the Burlington railroads are understood to be in the market for bridge material, but very little actual railroad business has developed.

Coke

Connellsville furnace coke is being sold for prompt delivery at $1.75, ovens, and some eastern furnaces are buying. At Chicago and Cincinnati offices, inquiries for large tonnages of furnace coke for last half delivery are pending. On contract, $2 seems to be the minimum quotation.

Finished Material

In finished materials, one important Cleveland office reports heavier specifications than for any week since last September. Other reports are not so favorable, but there is a better sentiment and while price concessions are being made rather freely on plates, the bar market shows considerable firmness.

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Throwing Light on Export Trade

ONE OF THE leading experts on foreign trade in the United States makes the remarkable statement that export trade in this country is enjoyed almost exclusively by large corporations and New York commission houses. The trade obtained by the commission houses is scattered so widely, and the prices they demand are so low that the middle-class manufacturer who fills their orders seldom gets enough of the business to make it worth while.

In Europe, the smallest manufacturer engages successfully in export trade. He carries on his business by direct sales to wholesale firms all over the world, and even enjoys advantages over the large corporation in having a smaller burden of overhead expense to be charged against his shipments. The banks discount his drafts against documents, so that the manufacturer receives cash at time of shipment, while the buyer at some distant port may have 90 days or more to pay for the goods after they arrive at destination.

A few "middle-class" manufacturers in the United States have been successful in getting export trade direct from foreign houses, and in some cases they have customers who have been on their books for 25 or even 50 years. These customers buy in good quantities and do not fuss about prices, and their orders help to keep the plant going in dull seasons at home. It is claimed, however, that only a few manufacturers in this country are doing export business on the basis followed in Europe.

The trouble seems to be in the shipping and in questions of credit. Americans do not understand that the foreign buyer is willing to pay a sight draft against bill of lading, that these drafts are readily discounted at regular banking rates, and that a refusal of a shipment is very rare among "respectable" foreign houses. When credit is extended it is done by making the draft read at 60 or 90 days sight, which allows the customer the time specified after the goods arrive. In the commercial law of foreign countries, an acceptance of a draft is irrevocable, and the customer must pay at maturity or go into bankruptcy. Losses are rare in extending credit in this manner, if proper inquiries are made before opening the account.

The difficulties of shipping seem to be exaggerated. The busy manufacturer in Ohio or Michigan who receives a foreign order is likely to throw up his hands at the thought of doing business direct with a firm in Australia or South America, if he has not been doing it long enough to have confidence in his own ability to handle it. He takes the easy road of asking the customer to pay "cash at New York", and in making his quotation he says nothing about freight rates. The foreign dealer whose trade is worth having wants an exclusive agency, and he can only be sure of this when he buys direct from the factory. Freight and other charges in transit will be two or three times as high as they should be unless the manufacturer obtains through contract rates and a through bill of lading. When the answer to an inquiry throws no light on this subject, the buyer does not send the order.

We are beginning to get light on these mysterious details of handling export trade. Data are coming out from authoritative sources which make it possible for the manufacturer who has not done export business to take hold of it on the right basis. The railroads, it seems, have been obtaining through contract rates and issuing bills of lading from the factory to any foreign destination, but they do not advertise this service and very few business men have known it. The banks are also beginning to discount drafts against export shipments. In a few years the "middle-class" manufacturer who receives foreign inquiries will be able to quote prices and rates and do export business as successfully as his competitors in Europe.

There is reason for rejoicing that a few large companies are making a fine showing in exports, but smaller concerns should be encouraged to be more aggressive in the foreign trade.

The action of President Wilson in refusing to endorse the agricultural loan bill, providing for government assistance to the extent of many millions of dollars, shows that there are some socialistic propositions which do not meet with approval at the White House. There are two

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distinct factions in the dominant party, one of which is the socialistic, and the other which adheres, to some extent at least, to the older and better traditions of the party in favor of encouraging individual action. The conflict between these factions promises to be interesting and will be closely watched by all students of modern tendency.

The More Daylight Movement

FOR centuries, according to excellent authority, certain Indian tribes of Central America have understood the value of sunlight in the treatment of rheumatism and tuberculosis and have required patients to expose themselves for hours to the sun. In modern life the great value of sunlight in promoting health and happiness has been by no means fully appreciated, but recent years have witnessed a very decided increase in appreciation of the importance of everybody enjoying as much daylight and pure air as possible. Hence, the action of the city of Cleveland in adopting eastern time, in order to give its citizens one hour more of daylight throughout the greater part of the year, has attracted much attention. Letters published elsewhere in this issue show how easily the change was brought about and how popular the change already is. "We have never," says one of the letters, "known a change so extremely radical to be taken up with so little confusion or friction, as was this change."

Another interesting point is that in many cases the action was taken after a referendum vote of the employes. This fact, together with the further fact that the expectation of the employes who thought they would like the change has been realized, will contribute to make the relations of employers and employes more cordial.

The only objection to the change which has much weight is that which expresses the fear that eastern time may not be as popular in winter as in summer. The answer to this objection is found in the ease with which the change was made, for several of the letters suggest that it would not be at all difficult to adopt a winter schedule with the hours one hour later. That the additional hour of daylight will add greatly to the enjoyment of thousands of people in Cleveland and other cities which are adopting eastern time, cannot be doubted and the more-daylight movement is likely to extend rapidly.

Clearing the Air

IMPORTANT victories have been won in Pennsylvania and New York by certain terminal and industrial railroads and by the shippers located along these lines, against the recent "tap line" opinion of the Interstate Commerce Commission. As far as these states are concerned, the theory of the Commerce Commission that these industrial lines were only "plant facilities" and should be treated as such by through railroads, has been completely upset. In findings returned within a few days of each other, the public service commissions of both New York and Pennsylvania declared these industrial lines were common carriers and were entitled to make rate agreements with connecting trunk lines, to receive rate allowances on traffic handled and to other similar privileges which they recently have enjoyed.

These decisions, of course, apply only to the intrastate traffic, within Pennsylvania and New York, as the jurisdiction of these commissions is only state-wide. They indicate, however, what may be expected in other states and pave the way for a very general attack by shippers in such jurisdictions which will tend to circumscribe considerably the effect of the commerce commission's recent opinion. The broader question of the position of these industrial roads in interstate traffic still remains to be tested out. It is learned that action in the courts along this line shortly will be inaugurated.

These developments promise to clear up some of the present confusion regarding the rights and relations of shippers, large and small, with the railroads that serve them. It is to be hoped that the final decision will be obtained promptly and in the most conclusive form. The country already has had ample demonstration in the pending increased freight rate case, of how prolonged uncertainty and suspense over so important a question, tends to unsettle and to retard commercial initiative if indeed it does not paralyze business.

Prices Present and Past

Quotations on leading products today, average for last month, average for three months ago and average for April, 1913. Prices are those ruling in the largest percentage of sales at the dates named.

	Today's prices.	Average for April, 1914.	Average for Feb., 1914.	Average for May, 1913.
Bessemer pig iron, Pittsburgh..	$14.90	$14.90	$15.09	$17.90
Basic pig iron, Pittsburgh.....	13.90	13.90	14.09	15.46
No. 2 Fdy. pig iron, Pittsburgh	14.15	14.15	14.09	15.04
Northern No. 2 Fdy., Chgo....	14.25	14.25	14.25	16.50
Lake Superior Charcoal, Chgo.	16.00	16.00	18.50	18.00
Malleable Bessemer, Chicago...	14.25	14.25	14.25	16.50
Southern No. 2, Birmingham..	10.50	10.50	10.50	11.70
Southern Ohio No. 2, Ironton.	13.50	13.50	13.00	15.00
Basic, eastern Pa.....	14.00	14.25	14.25	16.50
No. 2X Virginia furnace.....	12.75	12.75	12.75	14.50
No. 2X Foundry, Philadelphia.	15.00	15.00	15.00	17.00
Ferro manganese, Baltimore....	38.00	38.50	36.50	61.75
Bessemer billets, Pbgh. & Ygn.	20.00	20.80	21.00	26.50
Op. h'th billets, Pbgh. & Yn..	20.00	20.80	20.75	26.50
Bess. sheet bars, Pbgh. & Yn.	21.00	21.60	22.00	27.50
Op. h'th sh. bars, Pbgh. & Yn.	21.00	21.60	21.75	27.50
Steel bars, Pittsburgh.....	1.15	1.20	1.20	1.40
Iron bars, Philadelphia.....	1.22	1.22	1.27	1.57
Steel bars, Chicago.....	1.28	1.43	1.43	1.58
Tank plates, Chicago.....	1.28	1.33	1.38	1.63

	Today's prices.	Average for April, 1914.	Average for Feb., 1914.	Average for May, 1913.
Structural shapes, Chicago.....	$1.28	$1.35	$1.38	$1.63
Iron bars, Cleveland.....	1.20	1.25	1.30	1.63
Iron bars, Chgo. mill.....	1.10	1.15	1.20	1.57½
Beams, Pittsburgh	1.15	1.18	1.20	1.45
Beams, Philadelphia	1.25	1.30	1.30	1.60
Tank plates, Pittsburgh.....	1.10	1.15	1.20	1.45
Tank plates, Philadelphia.....	1.25	1.30	1.30	1.75
Sheets, blk., No. 28, Pittsburgh	1.85	1.92	1.94	2.28
Sheets, blue ann., No. 10, Pbgh.	1.35	1.40	1.40	1.75
Sheets, galv., No. 28, Pbgh....	2.80	2.92	2.94	3.39
Wire nails, Pittsburgh.....	1.55	1.60	1.59	1.78
Connellsville fur. coke, contr..	2.00	2.00	1.92	2.25
Connellsville fdy. coke contr...	2.50	2.50	2.50	3.00
Heavy melting steel, Pbgh....	12.00	12.00	12.37	13.06
Heavy melting steel, east'n Pa.	10.75	11.00	10.50	12.50
Heavy melting steel, Chgo.....	9.75	10.25	9.70	12.50
Heavy cast, eastern Pa.....	12.50	13.00	12.50	13.50
No. 1 wrought, eastern Pa....	12.50	14.50	13.50	15.50
No. 1 wrought, Chgo.....	8.75	9.00	9.50	9.20
Rerolling rails, Chgo.....	11.25	11.75	11.63	14.00
Car wheels, Chgo.....	11.25	11.50	12.25	17.00

(For Additional Prices See Page 934.)

Large Tonnage of Basic Bought

In the East and in Ohio—Additional Purchase at St. Louis —Portsmouth Company in Market

Apathy among consumers of pig iron extending over some weeks in the eastern Pennsylvania district was broken in a striking way the past week when several steel makers entered the market and closed for an aggregate of approximately 80,000 tons of basic iron for delivery over the third quarter and last half. One of these orders may be further increased, bringing the total movement to about 90,000 tons. The Lukens Iron & Steel Co. was the heaviest buyer, taking 50,000 tons for last half. The other buyers were the Central Iron & Steel Co. and the Harrisburg Pipe & Pipe Bending Co. The price at which the bulk, if not all, of this tonnage was closed was $14, delivered, which is considered very low in view of the delivery period. The tonnage was divided among five makers. This buying of steel-making iron is the largest the eastern market has witnessed in many months, but it appears to have been made at the expense of furnace profits. Apart from the movement in basic, the eastern Pennsylvania market has remained quiet, but miscellaneous sales make a better showing. One Delaware River pipe maker bought 2,000 tons of forge at about $14, delivered, and several hundred tons of low phosphorus foundry iron also were sold to other pipe shops. A lot of 500 tons of malleable at about $15.50, Philadelphia, also was included in the week's bookings. The usual price for standard northern No. 2X remains about $15, Philadelphia, but some brands are going 25 cents lower, and in a few cases higher is being obtained. Virginia iron is moving slowly, and the price is unchanged. The small lot price for standard low phosphorus remains $21, Philadelphia, but lower could be done on a tonnage.

The Commonwealth Steel Co., of St. Louis, bought 6,000 tons of northern basic iron in Chicago, the latter part of last week. This was in addition to the 15,000 tons of basic the company purchased the week before. There is an inquiry out in the St. Louis market for 500 tons of car wheel iron, and another for 500 tons of southern No. 2. At St. Louis, southern No. 2 is quoted all the way from $10.50 to $11, Birmingham basis. Northern iron is held at $14.25, Chicago furnace, and $13.50, Ironton.

Figure Big Tonnage for Tubes

A requirement of about 60,000 tons of foundry iron now has become active in the New York market through negotiations with both northern and southern furnaces, being carried on by prospective bidders for the new East river cast iron tubes, bids for which will be opened Friday. As reported, about 80,000 tons of cast iron segments will be required for this work. The grades of iron asked for by the bidding shops are Nos. 2 plain and 3, and the deliveries, beginning six months hence, will extend over two years. Apart from this negotiation, the metropolitan and surrounding market remains of small extent, though the tonnage is heavier in a scattered way. A Newark foundry still figures on 3,000 tons of No. 1X and No. 2 plain and reports having been quoted around $14.50, delivered; several other inquiries for Jersey buyers, including lots of 500 and 600 tons of No. 2 plain, are up. The Lackawanna railroad bought 300 tons of foundry, and a Bridgeport, Conn., buyer, inquiring for 500 tons of special high silicon, has closed. A report that a Bridgeport consumer recently purchased 2,000 to 4,000 tons of spot basic, is without foundation. This consumer has bought no iron recently. The usual going prices continue about $14.75, Jersey tidewater, and $15.45, New England, for No. 2X. Buffalo makers, it is understood, are meeting on the equivalent of $13.00, furnace, these figures which have been set largely by eastern and central Pennsylvania makers. A further sale of 1,500 tons of southern

(*For complete prices see page* 934)

foundry for shipment to Italy has been closed.

Tone Better at Pittsburgh

The Pittsburgh and valleys pig iron market is not so active this week as last, but furnace managers appear more hopeful about the future. Specifications are coming out in slightly better volume, and there is more interest taken in the future market. Prices have showed no improvement, however, and probably will not strengthen until after additional tonnage is sold. The Carnegie Steel Co. has blown out another stack at Farrell, Pa., now operating but one of the three furnaces at that point. Out of 58 stacks, the Carnegie company is running 31.

Buffalo Notes More Interest

Furnaces in the Buffalo district report that a little more interest is being taken in the market by consumers who have come out with a slightly increasing number of inquiries for iron. The inquiry covers both immediate needs and future requirements. The tonnage placed during the week amounted to about 5,000.

While the demand has been principally for limited lots of iron, some users are beginning to display a disposition to make inquiries regarding larger quantities. The producers say this shows the situation is reaching a point where the melters are giving consideration to their future needs.

Prices for pig iron in the Buffalo district remain the same as those quoted for some time.

Basic Activity in Ohio

In addition to the purchase of 15,000 tons announced last week, the United Steel Co., Canton, O., has continued quietly covering its requirements for the last half of the year and the total now aggregates about 40,000 tons. The purchasing was done without sending out a general inquiry and the placing of such a large tonnage was certainly not expected. No information concerning the prices paid has been made public. The Portsmouth Steel Co., Portsmouth, O., has sent out an inquiry for 10,000 tons of basic for third quarter delivery. The demand for foundry iron in the Cleveland district is extremely light, but deliveries continue at a fairly active rate.

A Little More Active

At Cincinnati, the market is a little more active, but demand is almost wholly for small lots for nearby shipment. A number of large melters in this territory state that most of them are well supplied with old contracts for the next six months and some of them will not need iron through the entire second half. This is because they have not been operating at full capacity for a long time and have not used up as much as was expected. Inquiry here includes from 1,000 to 2,000 tons of northern foundry iron from a northern Indiana melter, 3,000 tons of foundry iron from a manufacturer in Chicago territory, 700 tons of analysis iron from the Louisville & Nashville railroad and 500 tons of foundry iron from southern Illinois.

All efforts to break prices at Cincinnati during the past week have been unsuccessful, and although rumors have been numerous regarding lower priced southern iron, sales show that No. 2 foundry is still selling at from $10.50 to $11, Birmingham basis, for delivery from the present time through the second half. Southern Ohio furnaces are unchanged and firm at $13.50, Ironton, for No. 2 foundry.

Chicago Selling Basic Iron

The only activity apparent in the pig iron market in the Chicago district is seen in basic, which has been moving with more freedom the past fortnight than for some time. In addition to the purchase of 15,000 tons by the Commonwealth Steel Co., of St. Louis, this consumer has just closed for 6,000 tons at $14.50, delivered. This iron will be supplied by the Illinois Steel Co.

No activity is seen in foundry grades and quotations remain nominal at $14.25, Chicago furnace, for No. 2 foundry and malleable Bessemer. So many deferred shipments have been accumulated it is not thought at this time that prices for second half will be advanced over those prevailing during the first half unless an unusual demand becomes active within a short time. Melters apparently bought more heavily the first of the year than subsequent events justified and almost universally they have sufficient tonnage under contract to run them well into second half and in some cases almost enough to cover their entire requirements.

Southern iron remains inactive and while at least one interest represented here is quoting $11, Birmingham, for No. 2 foundry, the price at which practically all tonnage is moving is $10.50, Birmingham, for that grade. Five per cent silveries are obtainable in the Chicago market at $16.35, Chicago, which is 50 cents per ton lower than quotations which have prevailed. Some interests are still holding to higher quotations.

The Northwestern Iron Co., Mayville, Wis., blew out one of its two stacks May 16 on account of lack of demand for high phosphorus iron.

Ore Sales Are Very Light

And Vessels Are Going Into Commission Slowly on the Great Lakes

Profound lassitude still affects lake shipping. Actual ore sales have been light, though there has been some trading. There has been no price cutting on any but low grade ores, on which prices are always irregular. Inquiries for ore from furnace men are practically nil and while the movement of ore on the lakes is somewhat better than it was a week ago, it will be well into June before even the shippers get all of their vessels in commission. Not a single season charter has been made as yet, though a little wild tonnage has been placed for single trips. There never has been a time since the ore trade became the dominant trade of the lakes that the opening has been as lifeless as that of the present year.

Negotiates for Ore

One eastern Pennsylvania steel maker is negotiating for a term contract for iron ore and it is expected that a considerable tonnage of Superior ore also will be taken for the present season's delivery. Other than this one case, eastern furnace men continue to show practically no interest in ore purchases at this time. Foreign ores are wholly inactive.

Alloy Inquiry at Pittsburgh

Ferro-manganese dealers at Pittsburgh have received inquiries for several small lots of this alloy, not generally offered at $38, seaboard. Slight improvement in demand for ferro-silicon also is noted.

No Interest in East

The recent reduction of $1 a ton by English makers to the basis of $38, seaboard, appears to have had little or no effect upon the ferro-manganese market in the east. Sales remain few and small. Practically all leading consumers are well covered for months ahead.

(*For complete prices see page* 934)

General Sentiment Better

In Finished Materials at Cleveland, But Quotations on Plates Are Lower

The general sentiment as to finished materials is more optimistic in the Cleveland district. One important independent company reports that its specifications on leading products for the past week were the heaviest of any week since last September. There is, however, some weaknss in plates, and 1.10c, Pittsburgh, is more commonly quoted.

Inquiry for Plates at Pittsburgh

Demand for plates and shapes in the Pittsburgh district shows fairly satisfactory improvement over a fortnight ago, but buying is not yet heavy, and prices show no strength. As has been the case several weeks, some mills are offering material at less than 1.15c, and the market appears quotable at a range from 1.10c to 1.15c.

Unfavorable at Cincinnati

Sheared plates are quoted at 1.40c, Cincinnati, which is slightly under last week's quotations. The market is very quiet and conditions are unfavorable. Demand is entirely in small lots.

Chicago Plates are Down

Plates in the Chicago market apparently are being sold without regard to the Pittsburgh base and have declined in conformity to the lower quotations on other finished steel products. While business has been done on the basis of 1.25c, Chicago, the ordinary range of business is represented by 1.28c to 1.33c, Chicago.

Figuring on Electric Boats

Eastern shipyards are figuring on a fleet of 30 freight boats of unusual type, which are to be operated on the Hudson river and the New York state barge canal now building by the New York & Buffalo Steamship Co., just organized. The boats are to be 276 feet long, 40 feet beam and 6 feet draft loaded, and will be operated by electricity. Ten of the vessels are to be delivered this fall, ten next spring and ten in the spring 1916. Eastern Pennsylvania plate mills have been invited to bid upon the steel, the tonnage of which will not be heavy because of the light construction. The government will take bids May 22 on two oil barges to be built at Mare Island and requiring 500 tons of steel, largely plates. The tonnage coming to eastern Pennsylvania plate makers remains largely miscellaneous and usually is going at 1.30c, Philadelphia or 1.15c Pittsburgh. Attractive tonnages induce a considerably lower quotation and one round sale is figured back to about 1.15c, eastern mill. Eastern makers are interested in the approximately 7,000 tons of plates for the large Chesapeake & Ohio bridge at Portsmouth, O.

Plates for Barges

A requirement of 600 tons of plates is presented in the New York market for two barges for Panama, just awarded the Staten Island Ship Building Co. by the government. Small offerings largely constitute the local New York market, where prices range from 1.26c to 1.31c, delivered, or 1.10c to 1.15c, Pittsburgh, in accordance with the size and desirability of the particular order.

A Moderate Improvement

Noted in the Sheet Market at Pittsburgh— Prices Sagging at Chicago

Manufacturers of steel sheets in western Pennsylvania and eastern Ohio have noted a moderate improvement in inquiry the last few days, some of the heaviest consumers having opened negotiations for future requirements. Conditions in the northwest are described as normal so far as the sheet trade is concerned. Prices, however, continue low and unattractive, and have not yet showed any signs of betterment. Quotations are the same as a week ago.

Chicago Sheets Sagging

Sheets have sagged in the Chicago market to a basis of about 1.98c to 2.03c, and 2.98c to 3.03c, Chicago, for No. 28 gage black and galvanized, respectively. Some shading of these quotations has been reported and as low as 2.93c, Chicago, is said to have been done on galvanized.

Mills are shipping considerably more tonnage than current contracts amount to and order books are becoming depleted. A local interest has sufficient tonnage to run comfortably through June, but second half tonnage has not been available.

Several makers at Cincinnati report better new business during the past week and better specifications on old orders, but as a general rule, the situation is very quiet and unchanged. One of the larger makers reports that it is running at about 65 per cent of its total capacity. Black sheets No. 28 gage are given at 1.95c, galvanized No. 28 gage at from 2.90c to 2.95c, and blue annealed No. 10 at 1.45c to 1.50c, all Cincinnati basis.

Limited Buying in East

Makers of sheets in the eastern Pennsylvania market, while their plants are running well, are not able to see far ahead and the week usually begins with scarcely enough orders to see it through. Buyers are slow to place even small orders. Prices are easy. For the miscellaneous orders, 1.55c, Philadelphia, or 1.40c, Pittsburgh, for No. 10 gage blue annealed still is commonly obtained, but 1.50c, delivered, is being done on the more attractive specifications. Both eastern and Pittsburgh makers have made some further price adjustments to apply only to Pacific coast delivery.

Inquiry for Billets Light

Inquiry for billets is very light among eastern Pennsylvania makers and new business is practically nil. Specifications against old contracts are sustaining mill operations upon their recent fractional basis. Eastern makers quote rolling billets at $22.40, Philadelphia, or $20, Pittsburgh, and are resisting any efforts to induce them to cut that figure.

Semi-Finished Quiet at Pittsburgh

The market for semi-finished material in the Pittsburgh district is quiet, and unchanged in position. No inquiry of importance is before the trade. Billets are listed at $20 and sheet bars at $21, mill; wire rods, $26, Pittsburgh, and muck bar at $28, Pittsburgh.

Holding at Ashland

Billets are holding at $20.50, Ashland, after a decline of 50 cents two weeks ago. Wire rods are unchanged at $26.50, Ashland. The market is very quiet and specifications during the past week have been light.

The old nail factory of the Pottstown Iron Co., Pottstown, Pa., which has not been active for years, is being demolished.

(*For complete prices see page* 934)

Inquiry for Steel Bars

Includes Eastern Pennsylvania Implement Maker —Lower Prices at Chicago

One of the small implement manufacturers in eastern Pennsylvania has put out an inquiry for his requirements of steel bars, about 1,500 tons, for the year beginning July 1. Other similar buyers in that district have begun to sound the market. The market on steel bars at Philadelphia and vicinity remains 1.30c, or 1.15c, Pittsburgh, and there are no reports of shading. New orders are light, but specifications are fairly good. In concrete bars, the Carnegie Steel Co. has taken from the contractors several hundred tons for a Ford building at Indianapolis and 400 to 500 tons for a college building at Ann Arbor, Mich., and the Gulf States Steel Co., 560 tons for a Ford building at Atlanta, Ga.

More Interest By Buyers

Reports of implement manufacturers beginning to sound out the market on steel bar contracts for the six months or year from July, are current in the New York district. Some of these reports come from the west but also it is understood similar buyers in the metropolitan district are interesting themselves. New bar business remains light at New York. Makers in several specific cases this week refused to shade 1.31c, New York, or 1.15c, Pittsburgh, and this price appears firm. Shafting is easy at 65 to 66 off and one point more is reported.

Steel Bars Dull at Pittsburgh

The bar steel market is decidedly quiet in the Pittsburgh district, more so than that for plates or shapes. Mills continue to ask 1.15c, but that figure has not been severely tested. Heaviest consumers show no interest in the future market.

Bar iron is nominally listed at 1.30c, Pittsburgh, although reports of that figure being shaded are heard. At the bimonthly examination of bar iron sales sheets last week at Columbus, O., it developed that the average of sales by selected mills was at the 1.15c card, entitling puddlers identified with the Amalgamated Association of Iron, Steel and Tin Workers to a scale of $5.70 a ton for boiling. The same rate prevailed in March and April.

Steel Bars Lower at Chicago

Soft steel bars in the Chicago market are lower than a week ago in consonance with other finished steel products. While ordinary business is quoted at 1.33c, Chicago, careful buyers of attractive tonnages have been able to do 1.28c, Chicago, the equivalent of 1.10c, Pittsburgh. Although the bar market has an undertone of sentimental strength, it is not sufficient yet to have an effect on the market, and makers anxious for tonnage can see no possibility of higher prices at present.

Chicago Iron Bars Weak

Iron bars in the Chicago market are still quoted at 1.10c to 1.12½c, Chicago, but little business is going even at that level. Makers have not quoted below this because of the belief that even lower prices would not bring out tonnage.

The Empire and Union rolling mills at Cleveland are in operation this week rolling on a few orders and for stock. Business is very dull and there is no assurance that the mills will be able to operate next week. On steel bars, Cleveland mills are refusing to quote less than 1.15c, Pittsburgh.

Hoops Unchanged at Pittsburgh

The market for hoops and bands in the Pittsburgh district is unchanged in position. Hoops are listed at 1.25c and bands at 1.15c. Although mills are rolling cotton ties, no talk of price is heard. Cold-rolled shafting is weak and irregular.

Variety of Prices in East

Common grades of bar iron continue available at about 1.20c, Philadelphia. Some well known brands are $1 or more higher and some of the eastern railroads have been paying several dollars over the top figure for refined bars. Business remains dull with eastern Pennsylvania mills.

Bar Iron Low at New York

Recent sales of common merchant bars have been made by nearby mills at New York, at 1.20c, delivered. This is practically the minimum of the market. Some makers will not do this price.

Cast Pipe is More Active

In Chicago District—Contracts Pending and Awarded

Somewhat better tonnage of cast iron pipe was moved in the Chicago district during the past week than has been the case recently. The American Cast Iron Pipe Co. was awarded 1,000 tons of water pipe at St. Vital, Man., a suburb of Winnipeg, against bidding by Canadian foundries. The United States Cast Iron Pipe & Foundry Co. has taken 400 tons at Valley Junction, Ia.

T. C. Brooks & Sons Co., of Jackson, Mich., have taken the general contract for a pipe line 13 miles long at Moline, Ill., but the pipe for this work has not been placed. The project will take more than one year to complete. Bids are about to be opened at St. Louis for 1,000 tons of water pipe. Routine business from contractors has been exceptionally good the past few days, giving a better appearance to the market.

Ordinary Volume in East

Rather an ordinary market in cast iron pipe continues to prevail in New York City and surrounding territory. The volume neither is taxing capacities of the shops nor is it light in the aggregate. Small orders are fairly numerous. Small size pipe at this time is in better demand that the larger sections, but the shops have been able to get a fair assortment. Prices are unstable and vary according to the producer and the order. Some of the cast iron pipe shops may figure upon the approximately 80,000 tons of iron segments for the East river tunnel, bids for which will be taken on Friday. Perth Amboy, N. J., is taking bids this week on 2,500 tons of 30-inch. The Beaver Engineering & Construction Co. is the general contractor for the section of the Catskill aqueduct requiring 1,630 tons of 48-inch. The pipe for a contractor's letting of 775 tons of 36, 48 and some other sizes for Brooklyn, has not yet been placed.

Nuts, Bolts and Rivets

The market for nuts, bolts and rivets in the Pittsburgh territory continues quiet, and some manufacturers are not attempting to maintain regular discounts, apparently willing to quote according to the attractiveness of tonnage involved.

The New Britain Machine Co., New Britain, Conn., has increased its capital to $800,000.

(*For complete prices see page* 934)

Heavy Melting Material

Bought by Schuylkill Valley Steel Maker —Pittsburgh Scrap Dull

A Schuylkill valley steel maker in the eastern Pennsylvania market in the week bought about 4,000 to 5,000 tons of heavy melting steel at prices ranging from $10.75 to $11, delivered, for the choice material. Some not strictly No. 1 steel was taken at $10.50, delivered. Among the dealers in the eastern Pennsylvania market a more cheerful feeling is manifest, probably being founded upon the heavy buying by steel makers of basic pig iron in that territory in the week. Actual scrap conditions, however, are not improved and heavy cast, owing to the large offerings, has dropped 50 cents further. No. 1 wrought is extremely dull.

Brokers Cover Old Orders

Covering of old orders by brokers still is giving certain grades of old material at New York more support than current consumers' prices will justify. In heavy melting steel, some outstanding $12 orders have resulted in brokers paying $9.20, New York, for material. Other lots of steel, where holders have accepted the market, were done this week at about $8.75, New York. New business continues small, as consumers appear interested practically only in bargains.

The Panama railroad is expected shortly to bring into the New York market 500 to 1,000 tons additional of Isthmian material.

Looks Better at Buffalo

Dealers in the Buffalo territory report that the scrap market has developed an increasing interest on the part of consumers, judging from the inquiries developing. There is a disposition on the part of a number of the yards to pick up odd lots of scrap of the various kinds to meet a demand which is expected to develop in the near future to such an extent that the market will be much stronger.

Pittsburgh Scrap Quiet

The market for old materials in the Pittsburgh district shows no change in position, although some dealers are refusing to sell at prevailing prices. Heavy melting steel is being held at $12.50 by some middlemen, and sales of low phosphorus scrap at $15 are reported.

Weak at Cleveland

The tendency in the Cleveland scrap market, if anything, has been toward lower levels. Mill demand has been extremely light and buying, as a rule, has been at bargain prices only. The embargo on shipments to the Upson Nut Co. was lifted May 1, but the company still refuses all but occasional small lots. The Otis Steel Co. offers $10.50 for heavy steel, which about represents the dealers' selling price for this material. Rolling mill business continues light.

Prices Weak at Cincinnati

The market remains lifeless in Cincinnati. One dealer reports a small sale of bundled sheet scrap at $5 per ton and another a fairly good tonnage of stove plate at $7.45 per net ton, both orders going to outside consumers. Local foundries are very inactive and have not purchased any old material for a long time. Prices are weak and are fluctuating over a wide range because of the lack of transactions to form a basis of comparison. No. 1 machine cast remains weak and unchanged to the surprise of the market.

Chicago Scrap at Standstill

Practically no business is being done in the Chicago scrap market, as mills have sufficient stock on hand and brokers are not seeking business actively for fear of depressing prices further. It is essentially a buyer's market and quotations remain nominally at the range that has prevailed for the week past.

The Chicago & Alton railroad is offering 680 tons and the Burlington 1,500 tons.

Scrap iron is inactive at St. Louis, with no change in prices. The C., B. & Q. railroad has a list out for 4,000 tons.

Coke is Softer

On Prompt Delivery—Contract Prices Maintained

Spot Connellsville furnace coke is being offered at $1.75, ovens, although operators continue to ask 25 cents above that figure for contract delivery. An inquiry for about 15,000 tons, for shipment over 12 months, beginning July 1, is before the trade. Foundry grades show signs of slight weakness, but there has not been enough activity to test prices. The *Connellsville Courier*, for the week ending May 9, says production was 312,100 tons, an increase of 6,490 tons compared with the week before. Increase was made by furnace ovens, output of merchant ovens showing a decrease of 7,000 tons compared with the week ending May 2.

Drifting at Cincinnati

Demand for foundry coke has improved slightly in the Cincinnati district during the past week, but general conditions are unchanged. Both dealers and buyers are of the opinion that not much business will be transacted before next July, as old contracts cover practically all requirements up to that time. Prices are unchanged and the slight decreases that have taken place during the past few weeks appear to have been temporarily stopped.

Improvement at St. Louis

The coke market is looking a little better at St. Louis. A sale was made last week of 8,000 tons of foundry coke, and there is a bona fide inquiry out for 30,000 tons of furnace coke, and tentative inquiries for 30,000 tons of foundry grades, 10,000 tons of furnace and 3,000 tons of foundry. The sale of 8,000 tons was made by one dealer to another. Connellsville 72-hour foundry coke is held at $2.50 to $2.75, ovens, and the same grade of Virginia at $2.65 to $2.75.

Eastern Furnaces Buy Spot

Eastern Pennsylvania and other nearby furnaces more freely have been buying standard 48-hour coke for prompt and June shipment. Several of these consumers closed in the week for a total of about 20,000 tons of coke for these deliveries. The prices range from $1.75 to $1.80, Connellsville. Considerable buying of foundry coke remains in a scattered way in eastern markets at various prices, depending upon the brand and location of the material.

Wire Prices

Shaded for Prompt Specifications by Some Makers

Some makers are shading the 1.60c quotation on wire nails for prompt specifications, but the American Steel & Wire Co. is adhering to 1.60c and reports that business is fairly satisfactory.

Wire Specifications Better; Prices Softer

Specifications for wire products have been coming out in better volume the last fortnight, say wire makers in the Pittsburgh district, but consumers continue to show no interest in the market for future delivery. Leading makers have made no changes in prices, but material is going at less than the $1.60 base for nails. The market for nails is quotable at a range from $1.55 to $1.60.

Buffalo agencies report that the wire and wire products market is very quiet at the present time, with inquiry light and specifications nominal. No price changes are reported.

(*For complete prices see page* 934)

Structurals Not Active

Although Eastern Orders Are Somewhat Better —Strike at Cincinnati

About 200,000 tons of riveted steel work yet remains to be placed for subway and elevated railroad extensions in New York City, according to high authority. At the present time, 38 out of 74 sections of the work have been placed and the steel requirements under contract reach fully 200,000 tons. These rapid transit extensions remain of overshadowing importance in the metropolitan district, where other structural work is below normal. A better bridge tonnage is noted in the east, new inquiries and awards this week reaching about 7,000 tons. Including the large C. & O. bridge over the Ohio river, which is being figured in the east, fully 20,000 tons of bridge work is in sight in that section. Reports also have reached the east that the St. Paul and Burlington roads have entered the western market for bridge work. The plain shape market at New York City remains 1.26c to 1.31c, depending upon the attractiveness of the order. The minimum, which figures 1.10c, Pittsburgh, usually is being made by eastern mills with freight advantages over Pittsburgh makers.

Eastern Orders Slightly Better

Certain eastern Pennsylvania makers of structural shapes report some betterment in specifications and in small new orders for current rolling. Some mills in that district have a considerably better tonnage upon their books than a month ago. Market activity, however, is much below normal and the new tonnage in sight at this time in the Philadelphia and surrounding districts is light. On small orders, 1.30c, Philadelphia, or 1.15c, Pittsburgh, is usually obtained, but the more sizeable lots readily bring out concessions of $1 or more from this delivered figure.

Demand Heavier at Pittsburgh

Manufacturers of structural shapes in the Pittsburgh district say demand has improved fairly well the last few weeks. Material is being held at 1.15c, although reports are heard that some tonnage has sold at less than the general asking price. Although fabricators have not taken any especially attractive orders, inquiry is said to be better.

Buffalo Demand Growing

Interests in the Buffalo district report an increasing demand for structural material. The inquiry is greater than it has been in a number of weeks. Some of the mills report that it has had a bearing on increasing the activity of their plants.

The strike of the Hamilton county carpenter's union has seriously delayed building operations in Cincinnati, as a lockout has been declared by lumber mills in that city, which has thrown about 5,000 men out of employment and shut off the millwork supply from contractors. A number of the larger buildings now in the course of construction will be handicapped by this move and numerous contemplated structures will be abandoned temporarily until a settlement has been reached. The lockout will deprive builders of millwork only and does not include rough lumber. The carpenters have been out on strike since May 1, and demand, among numerous other things, an increase in wages of from 50c to 55c per hour, permission to lay hardwood floors and erect all metal and composition trim, to erect all stairs, and that all millwork mills be unionized. The builders and mills have refused to allow any of these concessions, and a lockout has resulted. This cessation of building activities has affected iron and steel warehouses in Cincinnati, as demand for reinforcing bars and building materials has fallen away, pending a settlement.

Chicago Structurals Lower

The Chicago structural market presents a lower level than a week ago and shapes can be obtained at 1.28c to 1.33c, Chicago, although the lower quotation is available only on the more attractive sorts of business. Absence of the usual run of large projects during this season has left the mills comparatively bare of tonnage and business of attractive tonnage is obtaining the minimum quotation.

Structural lettings in the west the past week have been unusually scarce. The municipal pier at Chicago, which has been awarded to the Warner Construction Co., has not yet been placed with a fabricator, as the contractor is not ready to begin his work until details as to payment have been settled. It is entirely probable the fabricating will be done by the Morava Construction Co.

STEEL CONTRACTS AWARDED.

Bridge work for Boston & Albany railroad, 1,165 tons, previously reported as having gone to various shops; division now announced gives Pennsylvania Steel Co. 615 tons; American Bridge Co., 450 tons and L. F. Shoemaker & Co., 100 tons.

Parochial school, 183rd street and Washington avenue, New York, 200 tons, awarded to Levering & Gerrigues.

Goldenberg store, Washington, D. C., 400 tons, awarded to C. A. Schneider & Sons.

Bridge work for Pennsylvania railroad, 200 tons, awarded to the American Bridge Co.

J. W. Clement Printing Co.'s new plant, Buffalo, Eastern Concrete Steel Co., Buffalo, general contract; Corrugated Bar Co., Buffalo, low on 400 to 500 reinforcing bars required.

Lackawanna Bridge Co., Buffalo, contract, 400 tons structural, Grand Trunk Ry. Co.'s grade crossing work at Detroit.

The American Enameling Co.'s plant, Massillon, O., awarded to the Massillon Bridge & Structural Co., 1,050 tons.

Addition to Roanoke, Va., shops and miscellaneous bridge work for Norfolk & Western railroad, 600 tons, awarded to Virginia Bridge & Iron Works.

Carter White Lead Co., corroding house, West Pullman, Ill., 1,426 tons, to the Kenwood Bridge Co.

C. R. I. & P. Ry. Co. subway crossings, Auburn Park, Ill., 316 tons, to the Morava Construction Co.

Anaconda Copper Mining Co., hydraulic construction, 500 tons.

STEEL CONTRACTS PENDING.

Bridge across the Hudson river at Mechanicsville, N. Y., for Boston & Maine railroad, 2,500 tons, bids being taken.

Highway bridge across the Lehigh river, connecting Bethlehem and South Bethlehem, Pa., about 2,000 tons or more, again up for bids.

Canal street subway, New York, 4,115 tons of structural steel, Underpinning & Foundation Co., low bidder. Alternate bids also taken on tube and cast iron construction.

Connecting loop, subway extensions, Forty-second street, New York City, 450 tons, Holbrook, Cabot & Rollins Co., low bidder on general contract.

Bridge work for Western Maryland railroad, 1,000 tons, bids entered and steel about to be awarded.

Bridge work in New Hampshire for Boston & Maine railroad, 200 tons, bids being taken.

Cleveland Railway barn, Cleveland, 1,600 tons, bids will be received May 21.

Dormitories for state hospital for feebleminded at Spring City, Pa., 200 tons, bids being taken.

(*For complete prices see page* 934)

Tin Plate Order

Taken by American Company From Standard Oil Co.

Despite active competition with Welsh mills, the American Sheet & Tin Plate Co., Pittsburgh, has taken an order from the Standard Oil Co. for 600,000 base boxes of tin plate, involving about 30,000 tons. Material will be delivered the second half of the year. Tin plate mills in western Pennsylvania and eastern Ohio continue to operate at practically maximum capacity.

The steel hull of the towboat "Aliquippa" was launched in the Allegheny river at Pittsburgh last week. The boat is owned by the Vesta Coal Co., a subsidiary of the Jones & Laughlin Steel Co., Pittsburgh.

Car Builders Are Hopeful

In Spite of Present Lull in Buying—Favorable Rate Decision Expected

Prospects of an early decision in the railroad rate case are putting car builders in a more cheerful frame of mind. It is believed that a favorable decision which in fact is expected will have a stimulating effect upon the equipment market. There are reliable indications that the railroads have accumulated a large amount of deferred needs which promise to be quickly released in the event that the result is to the liking of the transportation interest. Regardless of the character of the result it is believed that there will be a more active equipment market with the rate case finally disposed of.

Confirmed orders for cars the past week have reached about 1,300, a comparatively small number. The Denver & Rio Grande and the St. Louis, Brownsville & Mexico were the principal buyers. A report that the Chicago & North Western railroad has distributed 2,000 cars to the American Car & Foundry Co. is incorrect. There also is an unconfirmed report in the market that the Southern Pacific has awarded 900 box cars to a western builder. New inquiries for cars are few and no great number are expected until the air is cleared by the rate decision.

The rail market remains very poor. The Bethlehem Steel Co. rail mill is operating spasmodically and it is not expected that the Maryland Steel Co. mill will be active much beyond the present month unless conditions undergo considerable change.

Buying Cars at Chicago

The Chicago & Northwestern railroad has placed an order for 3,000 steel underframe box cars with the American Car & Foundry Co. The Illinois Central has placed an order with the same builder, according to reports, but this deal lacks verification. An order for 1,000 or more steel gondola cars is said to have been placed in this territory, with strict secrecy pledged by buyer and builder, and no information appears available.

CAR AND LOCOMOTIVE ORDERS.

The Denver & Rio Grande railroad has placed 500 gondolas with the Pressed Steel Car Co.

The Southern Pacific railroad is inquiring for 15 cabooses.

The St. Louis, Brownsville & Mexico has ordered 700 box cars and 30 tank cars from the American Car & Foundry Co. and 10 cabooses from the Mount Vernon Car & Mfg. Co.

Warehouses

Are Busier at Chicago—Improvement at Cincinnati

Considerably increased activity in the moving of warehouse products is apparent in the Chicago market. Although the brick strike continues to limit building to a considerable degree in the city proper, a certain proportion of building is of such pressing necessity that every means possible is being used, second-hand brick and hollow tile being utilized in many instances. This has the effect of releasing orders for considerable steel from warehouses and business apparently is on the increase.

Warehouses in the Cleveland district report a slight increase in demand for delivery in the city, where there is considerable new building in progress, but the volume of business is not yet satisfactory.

Improvement at Cincinnati

Warehouses in Cincinnati have been placing more orders recently and tonnage sold during the first half of May has been heavier than during either the first half or last half of April. Demand for building materials has been temporarily checked by the strike of union carpenters in this city, which has seriously delayed building operations. No changes in price are reported from last week, but fluctuations are over a wide range, due to underbidding of the market by several smaller dealers.

Better Feeling at Metropolis

Warehouse men in New York City hope that the better feeling noted in the market will be more productive of actual business in a short time. At this time, business is slow and considerably below normal. Some jobbers, however, are doing better than a month ago. Prices are unchanged.

Pittsburgh Pipe Market

There is no material change in the market for tubular goods in the Pittsburgh district. Prevailing prices are being well maintained by leading manufacturers of steel pipe, although reports of concessions still are heard. An order for 30 miles of 16-inch pipe is expected to be placed this week, for delivery to a local gas company, and it is understood several quiet negotiations are pending. Iron pipe and boiler tubes are unchanged in position.

METAL MARKETS

New York

May 19.

Copper. — Demand for refined copper is somewhat better today but there is no improvement in price. Producers and leading selling agencies hold electrolytic at 14.25c, delivered 30 days, but this price can be shaded in the outside market to 14.15c. On a wholesale contract basis, electrolytic is quoted at 13.95c to 14c, cash. Prime casting is held at 13.87½c, cash. Prime lake is offered at 14.40c to 14.50c, cash. The London market is fluctuating within narrow limits with the tendency toward higher levels. Today's London close was £63 6s 3d on spot and £63 18s 9d on three months. Exports are fairly heavy and total 22,578 tons since May 1.

Tin.—Following the recovery last week from the extremely low levels of the preceding week, the price of tin again is headed downward. Yesterday there was a drop of £6 5s in the price of spot and today a further drop of £1. The London close today was £149 5s on spot and £151 on three months. In New York, today's price on spot, May and June is 33c. July is held at 33.12½c. Demand is very limited.

Lead.—Independent producers now are willing to take all business offered at the leading interests' price of 3.90c, New York, thus bringing the two ends of the market on a parity in the east. Demand is dull.

Spelter.—This market is firm but demand dull. Prime western brands are quoted at 5.10c to 5.15c for New York delivery.

Antimony.—This market is extremely dull. Prices for large lots, duty paid, New York, are as follows: Cookson's 7.25c to 7.35c; Hallett's, 7c to 7.25c; United States, 7c to 7.12½c; other brands, 5.87½c to 6.12½c.

Chicago

May 19.

New metals in the Chicago market present little change from last week, slight strengthening in spelter and pig tin being the only changes.

We quote dealers' selling prices f. o. b. Chicago:

Lake copper, carload lots, 14.25c; casting, 14.25c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 5.05c; lead, desilverized, 3.80c; sheet zinc, $7.00, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 35.00c; Cookson's antimony, 7½c; other grades, 6c.

No life is apparent in the old metals market and practically none is being moved. Accumulations in the hands of dealers and producers continue to grow but the only activity is filling old contracts. Quotations are the same as those presented a week ago.

We quote dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 13.50c; copper bottoms, 12.00c; heavy red brass, 11.75c; heavy yellow brass, 9.00c; No. 1 red brass borings, 10.50c; No. 1 yellow brass borings, 8.00c; brass clippings, 9.25c; lead pipe, 3.60c; zinc scrap, 4.00c; tea lead, 3.50c; No. 1 aluminum, 14.00c; No. 1 pewter, 23.50c; block tin pipe, 32.50c; tin foil, 28.00c; linotype dross 3c; electrotype dross, 3c; stereotype plates 4.25c; stereotype dross, 3c.

(*For complete prices see page* 934)

Farrell Makes a Big Hit

Iron and Steel Institute Pleased With His Optimism—Slight Improvement in British Markets

Office of The Iron Trade Review,
Princes' Chambers, Corporation St.,
Birmingham, Eng., May 9.

The optimistic note struck by James A. Farrell, president of the United States Steel Corporation, at the meeting of the Iron and Steel Institute was timely and welcome. Practically every British steel-maker of importance was present, and the continent was well represented. It was very welcome news from Mr. Farrell that "from a variety of circumstances which have occurred and are occurring, many close observers of the trade of the world forsee indications that the industry is gradually emerging from an unsatisfactory condition to one in which commercial confidence is being re-established. * * * In my opinion, based upon a careful survey of the situation, an improvement in trade conditions, both as to tonnage and values, is not very far off." This confident prediction was discussed after the dinner by prominent steel makers, who naturally place great reliance upon Mr. Farrell's unique opportunities of gaging the markets.

As far as this country is concerned, the improvement can hardly yet be described as having set in. At the Birmingham meeting of Thursday there was great pressure to obtain lower prices of iron, and, in a few cases, the efforts succeeded. At the same time, buyers are watching the market with the greatest keenness, and will place orders whenever they decide that the bottom has been reached. The strongest department is the marked bar trade, in which a quoted rate of £8 10s ($41.62) is resolutely maintained, although this is £2 ($9.78), and in some cases £2 2s 6d ($10.40)), above the unmarked bar rate, a very unusual state of affairs, but makers of best iron are in a good position. The case is totally different with unmarked bars, some makers of which have the greatest difficulty to find their employes work enough to keep the wolf from the door. Galvanized sheets are by no means strong, and one large Welsh firm was yesterday prepared to accept £10 17s 6d ($53.26) for a large order. This is largely accounted for by increased supplies of Belgian bars. It is said that this again is due to financial reasons, the larger vendors being obliged to get rid of their material, even at an unprofitable price. There was very little business in gas strip.

Cleveland is taking the lead in pig iron with a steady flow of orders. Experts in that district express themselves very well satisfied with the undertone, especially having regard to the increasing scarcity of material. There has been a rise of about 6d in Cleveland prices and a decrease in warrants, so that the amount in store now amounts to 95,000 tons. Practically, in all the districts the same reduction of stock is going on, and the firmness of pig iron, in spite of the most desperate bearing efforts, is highly significant. For foundry iron the demand is remarkably good, and indeed the supply of high-class brands is below the demand. The Northamptonshire makers are in some cases asking 50s for forge iron, which is quite 2s above recent quotations. Apparently, consumers were not disposed to take the same view of the position, and many of them are ready to run risks before placing contracts. There is some anxiety in the North on account of the steady depletion of the stores. The hematite department is a strong market, and the tone has been improved by a large inquiry from Russia, which promises to be a very good customer. The hematite market at Barrow is still depressed, and very little business is done, but makers hold very firmly to recent quotations, for the excellent reason that they are very well sold forward. Prices of coke are slightly easier.

In Two States

Decision of Interstate Commerce Commission is Set Aside

Rights of industrial and terminal railroads to receive as common carriers allowances and divisions from through lines on intrastate traffic have been sustained this month by public service commissions of two states. The opinion of the Interstate Commerce Commission in its industrial railways case decision, as of Jan. 20, last, was set aside in both cases. An adverse opinion also has been handed down by the Canadian railroad commission, in a similar case.

The New York public service commission, on May 6, handed down a decision in which it recognized the South Buffalo railroad as a common carrier, entitled as such to participate in joint rates and allowances. The road is controlled by the Lackawanna Steel Co., and serves plants owned by that and other interests. Main line railroads connecting with the South Buffalo road were ordered to restore rate agreements cancelled April 1.

Last Thursday, the Pennsylvania public service commission, after hearing complaints of the Monongahela Connecting railroad, a Jones & Laughlin Steel Co. subsidiary, and the Union railroad, controlled by the Carnegie Steel Co., filed an opinion prohibiting the Pennsylvania, the Baltimore & Ohio and the Pittsburgh & Lake Erie railroads from suspending tariffs effective May 15 proposing to cancel joint rates and allowances to short line roads at this center.

The Canadian railroad commission has ordered railroads operating in this country and Canada and connecting with the Essex Terminal railroad to continue joint rates and allowances. The Essex Terminal road serves the Canadian Bridge Co. and 34 other shippers and receivers at Walkerville, Ontario. Main line carriers filed tariffs cancelling joint rates but the commission refused to allow them to stand.

Will Hear Other Cases

The Interstate Commerce Commission, it will be recalled, looked upon industrial railroads as plant facilities, and referred to them as "instruments for compelling rebates from railroads". The public service commission of Pennsylvania ordered present rates on intrastate traffic to the Monongahela Connecting and Union railroads continued until further notice. Other complaints, including those of the Cambria Steel Co. and the Bethlehem Steel Co., will be heard the first week in June.

Trunk line carriers affected by the decision may appeal within 30 days after the decision was filed.

The decisions of the Pennsylvania and New York state commissions apply only to traffic originating, or consigned to points within those states. The question whether or not the rate allowances to terminal roads on interstate traffic shall prevail still remains to be settled and shippers are planning soon to test out in the United States court the opinion of the commerce commission upon this point. It is understood the commerce commission has agreed to put its recent opinion in the form of an official order to permit the matter to be brought into the courts. The South Buffalo Rail-

way Co. is preparing to bring action along this line, as the next step to the recent decision in its favor.

Joint Rates

Strongly Advocated at Hearing Before State Commission

Statements were begun May 19 before the Ohio Public Utilities Commission in the court house, Cleveland, following the filing of a complaint by the Lake Terminal railroad of Lorain, a subsidiary of the United States Steel Corporation, protesting against the cancellation of joint rates with that road by trunk lines with which it is connected, following the decision of the Interstate Commerce Commission holding the Lake Terminal, among other roads, to be not a common carrier. The protest of the Lake Terminal covers only intrastate business, and is directed against the Nickel Plate, Lake Shore & Michigan Southern, Baltimore & Ohio, Lorain & West Virginia and Wheeling & Lake Erie railroads with which it connects, and every other common carrier operating in Ohio.

Squire, Sanders & Dempsey, attorneys for the complainants, pointed out the privilege of joint rates and "spotting" charges had been in force with this road for years during which time it has tacitly performed the functions of a common carrier. It was incorporated in 1895 by Tom L. Johnson, who had the intention of extending it to Cleveland and Sandusky and south to the Pennsylvania main line. Testimony later was introduced to show that the road served beside the National Tube plant, which it surrounds, public team tracks, local retail coal shippers and through ore traffic not connected either with the Tube plant or other Corporation subsidiaries.

Attorneys representing the Baltimore & Ohio, Pennsylvania, Erie and Lake Shore & Michigan Southern railroads held the Lake Terminal railroad had failed to comply with many of the obligations incumbent upon common carriers under Ohio statutes; and further objected the commission was nowhere given power to hear a case in which a common carrier comes as plaintiff to compel another common carrier to absorb its charges; in other words that the complaint should be brought by the shippers who have been discriminated against, not by the railroad.

The Wheeling & Lake Erie railroad, through a representative, stated that it had cancelled the joint rates with the Terminal road, unwillingly at the instance of the Commerce Commission, and would favor the return of the former system, as being more equitable to the shippers on the Terminal road and more advantageous to itself.

The case of the Newburgh & South Shore railroad, of Cleveland, subsidiary of the American Steel & Wire Co., covering the same point will be taken up at the present sitting of the commission.

Complaints have also been filed at Columbus by the American Sheet & Tin Plate Co. and the Carnegie Steel Co., as shippers, protesting against the cancellation of joint rates with industrial roads.

Obituaries

James T. Merritt, at one time superintendent of the Federal Steel Foundry Co., Chester, Pa., died recently at Chester.

The death of John Bain, of James Bain & Son, machinery manufacturers, Hamilton, Ont., in his 41st year, occurred on May 13 after a long illness.

J. Howard Ewald, president of the Pittsburgh Forge & Iron Co., died suddenly at his home in Kirkwood, St. Louis county, on May 18. He was a brother of L. P. Ewald, the late Louisville & Nashville railroad ironmaster. Death was due to pneumonia.

Henry R. Luther died last week at his home in Higham, Mass. For many years, he was a partner of Fred F. Stockwell in the foundry business of the Barbour-Stockwell Co., Cambridge. Failing health caused his retirement from active business two years ago.

James Reid Wilson, of Montreal, died at the Grand hotel, London, Eng., recently from an attack of pneumonia, aged 57 years. He was president and managing director of Thomas Robertson & Co., Ltd., of Montreal, wholesale hardware and metal dealers, and a director of the Dominion Steel Corporation, the Canadian Steel Foundries, Ltd., the Montreal Locomotive Works, Ltd., and several other industrial companies.

John J. C. Smith, inventor of machinery for making insulated wires and compression castings, died at his home in Passaic, N. J., recently, aged 79 years. He was born in Bavaria and came to this country as a boy, settling in Boston. Later, he moved to Passaic, where he founded the Okonite Co., manufacturer of insulated wires. One of Mr. Smith's patents for making dies for coins and stamps was purchased by the government some years ago and is still in use. Mr. Smith's inventive ability brought him in close touch with prominent men in his line, and he was associated with Thomas A. Edison in his early days and with Alexander Graham Bell, inventor of the telephone.

Francis J. Peck, president of Francis J. Peck & Co., chemists, Cleveland, died at his home in that city May 16 after a brief illness from pneumonia. Mr. Peck was born at West Farmington, O., Sept. 7, 1866. He graduated from the University of Michigan, taking the B. S. degree in 1891 and the E. M. degree in 1892. After being connected with The Mansfield Iron Mining Co., Crystal Falls, Mich., for one year as a chemist and for one year with The Commercial Mining Engineers & Chemists, Chicago, he came to Cleveland and opened a branch office for that organization. He later engaged in business for himself and for many years had made a specialty of the analyzing of iron ore.

Word has reached this country of the death at Paris, May 9, of Paul Louis Toussaint Heroult, whose development of the electric furnace for the reduction of metals gained him world-wide fame. Death was rather unexpected and was due to typhoid fever. His age was 51 years. M. Heroult was best known in this country as the originator of the Heroult electric furnace process for steel making which in the United States is controlled now by the United States Steel Corporation. Previous to granting the rights of this process to the Steel Corporation, several years ago, M. Heroult, with associates, installed types of furnaces in various plants in this country. Other licenses have been granted since by the Steel Corporation. Installations of Heroult steelmaking furnaces are in operation at the Worcester, Mass., and South Chicago plants of the Steel Corporation. M. Heroult's development of the electric furnace as applied to aluminum, originally gained for him a high position in the metallurgical world. He patented his aluminum process in 1886 and it attracted world-wide attention. The adaption of the furnace to other metals followed. M. Heroult had been associated in a prominent way with different steel and aluminum works of Europe. His birthplace was Thury-Harcourt Calvadous, France, and he received his education in London and at various French institutions.

The city of Norwalk, Conn., is to build a municipal electric lighting plant in East Norwalk at a cost of about $25,000.

When the Clock Was Put Ahead

And Eastern Central Time Was Adopted in Cleveland—Manufacturers and Others Approve the Change—Some Are Enthusiastic

The adoption of eastern standard time by the City of Cleveland, May 1, is attracting attention throughout the country, especially in the central western states, and many other cities are considering the advisability of adopting that time; in fact, some cities have followed the example of Cleveland.

In order to ascertain whether the adoption of eastern standard time is proving satisfactory and is likely to continue to be satisfactory, especially to the employes of manufacturing companies, THE IRON TRADE REVIEW addressed a letter of inquiry to manufacturers, the telephone companies and a few large stores, asking the following questions:

1. *What were the hours of your employes prior to May 1? Kindly state whether you used sun time or central time.*
2. *What hours did you adopt on May 1?*
3. *If you have made a change, what results have you noticed?*
4. *Is the change popular with employes?*
5. *Has it resulted in much tardiness or confusion of any kind?*
6. *Do you think that eastern standard time will be as popular in winter as in summer?*
7. *On the whole, do you believe that the change has been shown to be a wise one?*

The answers indicate an overwhelming sentiment in favor of the change. The largest employer in Cleveland, the American Steel & Wire Co., found that on the first day of eastern time there was no confusion and almost no tardiness. The change is popular with its employes and is likely to continue so, even in winter, as they have been in the habit of getting up before daylight.

The experience of the Wellman-Seaver-Morgan Co. has been similar to that of the American Steel & Wire Co. As to whether eastern time will be as popular in winter as in summer, the company is not willing to make a prediction, but believes on the whole that the change has been a wise one.

At the offices of M. A. Hanna & Co. the new plan works satisfactorily, and it is believed that it will be as popular in winter as in summer. F. A. Hawkins, manager of the Marshall Drug Co., which has numerous drug stores throughout the city, is enthusiastic in his endorsement of the change. "It is," he says, "the best thing that ever happened for Cleveland and for us." He states that the change was made without confusion and is popular with the employes.

The steam railroads, with the exception of the Erie and Wheeling & Lake Erie, are still running on central standard time and citizens intending to take trips sometimes find themselves at the depot an hour ahead of time. It is understood, however, that the Pennsylvania and Lake Shore are considering the advisability of adopting eastern time in Cleveland. Some interurban lines are on central and some on eastern time. Traveling men going to and from Cleveland on trips to smaller towns in the state report that some confusion is caused by the new change.

Letters of representative employers to THE IRON TRADE REVIEW are as follows:

The F. B. Stearns Co.

By Wm. M. Blackburn, Purchasing Agent

Prior to May 1 we used central standard time and are working the same hours now that we did previous to that time—the only difference being that our clocks were moved ahead one hour. We have noticed no difference and our employes seem to be entirely satisfied, as a referendum vote was taken on this question before the matter was decided.

* * *

The Sterling & Welch Co.

By A. C. Hook, Sec'y and Treas.

Our opening and closing hours were not changed from the hours used under the old central standard time. We feel that we are voicing the sentiments of all of our employes when we say that the change is popular with them, and would add that the change did not result in tardiness or any confusion. There may be a short period in the winter months during which eastern standard time will not work out to as good advantage in the morning, but it is our opinion that the many advantages gained during the summer months and the many opportunities given for recreation after business hours during the summer period will off-set any objections to the change that might be made during the winter season.

* * *

The Cleveland Hardware Co.

By Chas. E. Adams, President

We made no change of any kind in our working hours, simply turning our clocks ahead one hour and holding to the old schedule. We suppose, considering the fact of our starting at 6:30 a. m. and working until 11:30 and from 12:00 to 5:00 p. m., we really were working on sun time before. We had practically no confusion at our plant; in fact, on the first day, we do not believe the lates were anything above normal and we have experienced no trouble since. It is very popular with our employes,

(*Continued on page 928*)

Plant Trips

Will Be Taken by Boiler Makers in Annual Convention

Inspection trips to important industrial plants in the vicinity will be among the principal features of the annual convention of the Master Boiler Makers' Association and the Boiler Makers' Supply Men's Association, to be held at the Hotel Walton, Philadelphia, May 25, 26, 27 and 28. On Wednesday, a special train will take the visitors on a trip to Coatesville, Pa., and Parkesburg, Pa., where the plants of the Lukens Iron & Steel Co. and of the Parkesburg Steel Co. will be visited. The Parkesburg Iron Co. will provide the special train for this occasion and the Lukens Iron & Steel Co. will compliment the visitors with a lunch at Coatesville. On Thursday afternoon, a special inspection trip to the Baldwin Locomotive Works, Philadelphia, will be made. A number of interesting social features have been provided by the committee in charge, including an annual reception and dance at the Hotel Walton, Monday evening, a theater party at Keith's Theater Tuesday evening and the annual banquet at the Walton Thursday evening. The program of the business sessions includes a number of discussions upon live subjects in boiler shop and manufacturing practice. W. H. S. Bateman, of the Parkesburg Iron Co., Philadelphia, is chairman, and G. T. Schnatz, of the Lukens Iron & Steel Co., Philadelphia, is secretary and treasurer, respectively of the local committee of arrangements.

Sobriety and Safety

In the central Y. M. C. A., Cleveland, this week, an exhibit is being given to show the bad effects of saloons in the neighborhood of manufacturing establishments. "Sobriety First—Safety Follows" is the slogan of the exhibit. Miss Edith Wills, of Boston, field secretary of the Scientific Temperance Federation; Mrs. Lillian Burt, of Columbus, state superintendent of Temperance of the Ohio Sunday School Association, and Thomas D. West, father of the "Back with the Saloon" movement, are taking an active interest in the exhibit, and signatures are being obtained to a petition to the legislature of Ohio for the passage of a law providing against the establishment of saloons nearer than 1,000 feet of a factory.

Canadian Iron Arrives.—The British steamer Heathcote, with a cargo of about 3,500 tons of Wabana, Nova Scotia, pig iron, arrived at Philadelphia, May 15. As previously stated, this cargo represents the third of its kind to reach this country in recent weeks and the iron is to be applied on orders taken some time ago by the representatives in this country of the Dominion Iron & Steel Co.

Many Accept

And Record Attendance at Institute is Probable

When President E. H. Gary calls to order the sixth general meeting of the American Iron and Steel Institute in the Astor Gallery of the Waldorf-Astoria, New York City, Friday morning, May 22, he will face the largest gathering of institute members ever held in New York City, and probably in the history of the organization. The liberal way in which acceptances have been received makes it probable that the high water mark of attendance at the Chicago meeting last fall, when 480 members were present, may be surpassed. At this time, more than 400 acceptances have been received.

The complete program for the meeting now has been made up and shows little change from the tentative announcement previously made.

New Rolling Mill

The board of directors of the Driver-Harris Wire Co., Harrison, N. J., has taken favorable action on the project of erecting the new rolling mill which has been in prospect for about two years. This mill is to be put up immediately. It will be used for cold rolling strip steel up to widths of 5 and 6 inches. Heretofore the company has been able to roll only 1½ and 2 inches in width. The product of the mill will be mainly strips of the company's special alloys for electrical work. The new rolling mill and the equipment to be installed in connection with it will be housed in a separate building, about 100 x 200 feet, which will be erected at once.

Donner Made Chairman

W. H. Donner, president of the Cambria Steel Co., now is serving as chairman of the board of directors of the Pennsylvania Steel Co., having been elected to that newly created position by the board of directors at an organization meeting held at Philadelphia, May 15. At the same time, Edgar C. Felton was re-elected president of the company.

New Record

In Production of Shapes Last Year—Other Statistics

The total production of beams, beam girders, zee bars, tees, channels, angles and other forms of heavy and light iron and steel structural shapes in 1913 amounted to 3,004,889 gross tons, against 2,846,487 tons in 1912, an increase of 158,402 tons, or over 5.5 per cent. These figures have just been published by the bureau of statistics of the American Iron and Steel Institute. Of the total in 1913, 2,553,806 tons were heavy structural shapes, against 2,470,415 tons in 1912, an increase of 83,391 tons, or over 3.3 per cent, and 451,083 tons were light structural shapes, against 376,072 tons in 1912, an increase of 75,011 tons, or nearly 20 per cent. In 1913 there were 39 works in 10 states which rolled heavy or light structural shapes.

The total production of iron and steel wire rods in 1913 amounted to 2,464,807 gross tons, against 2,653,553 tons in 1912, a decrease of 188,746 tons, or over 7.1 per cent. In 1913 the steel wire rods rolled amounted to 2,463,975 tons and the iron rods to 832 tons, as compared with 2,652,264 tons of steel and 1,289 tons of iron rods rolled in 1912. Small quantities of steel copper-clad wire rods are included in the totals of recent years.

The production of wire nails in 1913 amounted to 13,559,727 kegs of 100 pounds, as compared with 14,659,700 kegs in 1912, a decrease of 1,099,973 kegs, or over 7.5 per cent. Steel wire nails only were made in both years.

The production of iron and steel nails and spikes cut from plates in 1913 amounted to 842,038 kegs of 100 pounds, against 978,415 kegs in 1912, a decrease of 136,377 kegs, or over 13.9 per cent.

Of the total production of pig iron in 1913, 21,442,267 tons were made for the consumption of the makers and 9,523,885 tons were made for sale; total, 30,966,162 tons. These figures are revised and differ from those which appeared in Special Statistical Bulletin No. 1.

The Racine Drop Forge Co., Racine, Wis., has closed a contract with the Peerless Silo & Supply Co., Racine, for 500,000 forged silo clamps, to be delivered during the next 12 months. This contract and another large one are sufficient to keep the plant busy through this year. The Racine Drop Forge Co. has just moved into a new plant much larger than its former quarters.

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

The spirit of loyalty to the organization and the willingness to serve it wherever they are most needed, which frequently has been shown by members of the National Metal Trades Association, was again exemplified at the recent meeting in Worcester, when H. N. Covell, an ex-president, was drafted for services on the administrative council, "You might pile a ton of pig iron on Covell and you could not keep him down," is the way one of his friends spoke of him the other day in describing his indomitable energy. Mr. Covell was one of the founders of the National Metal Trades Association, and was largely responsible for the preliminary meeting held Aug. 21, 1899, which resulted in the permanent organization of the association. At that meeting, he presented a draft of the first constitution and by-laws. Officers were elected as follows: F. H. Stillman, the Watson-Stillman Co., New York City, president; Geo. Watts, the Watts-Campbell Co., Newark, N. J., vice president; A. J. Caldwell, of Henry R. Worthington, Brooklyn, secretary; and H. N. Covell, of the Lidgerwood Mfg. Co., Brooklyn, treasurer. It was decided that the officers elected at that time should continue in office until the first general meeting of the association could be held. This meeting took place at the Waldorf-Astoria, Dec. 4, 1899, and resulted in Geo. D. Selden, of the Erie City Iron Works, Erie, Pa., being elected president; F. H. Stillman, first vice president; Chas. L. Newcomb, of the Dean Steam Pump Co., Holyoke, Mass., second vice president; A. J. Caldwell, secretary; and H. N. Covell, treasurer. Mr. Covell, being first vice president at the time, subsequently filled out the unexpired term of President S. W. Watkins, of the National Electric Co. He was appointed president of the association at the sixth annual convention, held at the Hotel Walton, Philadelphia, March 23 and 24, 1904, and continued to serve in that capacity until the seventh annual convention of the association, held at the Auditorium Hotel, Chicago, March 23 and 24, 1905, when J. Willis Gardner, of the Gardner-Governor Co., Quincy, Ill., was elected president.

David B. Coey has resigned as district sales agent at Chicago for the Stark Rolling Mill Co., Canton, O., and is now associated with J. V. Cowling & Co., 973 Continental & Commercial National Bank building, sales agent for sheets, plates and other finished steel products.

S. B. Harding, formerly consulting engineer and director of the Modern Steel Structural Co., Waukesha, Wis., has resigned.

President James A. Farrell, of the United States Steel Corporation, who has been abroad for several weeks, has returned.

C. A. DeHaven, formerly with the Midland Valley railroad, will have charge of offices recently opened at

H. N. COVELL,
A Leading Spirit of the National Metal Trades Association

Kansas City, Mo., by the Corby Supply Co., southwestern representatives of the Chicago Pneumatic Tool Co., Chicago. He will cover Kansas City, St. Joseph, Leavenworth and Atchison.

C. H. M. Atkins, president of the Warner Elevator Mfg. Co., Cincinnati, has returned from a business trip through the eastern states.

W. D. Jacaway will sail within a few days from San Francisco to assume the superintendency of the open-hearth department of the Broken Hill Proprietary Co., Ltd., New Castle, N. S. W., Australia. The company is building a new steel plant. Mr. Jacaway has been superintendent of the open-hearth department of the Lackawanna Steel Co., Buffalo, N. Y.

C. E. Bertie, who has been attached to the Chicago office of Rogers, Brown & Co. as a salesman, has resumed his former position of several years ago as salesman for the same firm in the territory covered by the Philadelphia office. Mr. Bertie left the Philadelphia office of Rogers, Brown & Co. several years ago to engage in another line of business in the south, but subsequently resumed his connection with the firm in Chicago.

Edgar F. Smith, provost of the University of Pennsylvania, has been awarded the Elliott Cresson gold medal of the Franklin Institute of Philadelphia, in recognition of his work in the field of electro-chemistry. The presentation was made at Philadelphia, May 20, and at that time Dr. Smith delivered an address entitled "Scientists From the Keystone State". The Elliott Cresson medal is the highest award in a gift of the Franklin Institute.

Louis Wilputte, general manager of the Otto Coking Co., 6 Church street, New York, recently returned from a several weeks' trip in England, and Germany, where he inspected large by-product coke plants now being installed by the German company, of which the Otto company is the American representative. Mr. Wilputte states that by-product coke oven construction is proceeding actively in these countries, 12 plants in England and 15 in Germany now being under way.

John J. Shannon, for many years superintendent of the ore mines and furnaces of the Sloss-Sheffield Steel & Iron Co., Birmingham, has accepted a position with the Woodward Iron Co., Woodward, Ala., as assistant to the vice president. He will have charge of the furnaces of the company at Woodward and Vanderbilt. B. E. Purser, recently appointed general superintendent of the mines of the Woodward company, will have complete supervision of all the mines, in both the ore and coal divisions. Morris W. Bush, general superintendent of the Woodward company for several years, will retire and devote the greater part of his time to business in connection with his father's estate. Mr. Bush is now in Los Angeles, where he has been for several weeks for his health.

Zinc Mine

Being Opened in New York on Important Scale

Mining operations on a large scale will be instituted in a few weeks by the Northern Ore Co., of Philadelphia, upon an extensive new zinc property located near Edwards, St. Lawrence county, New York State. The commercial exploitation of these deposits will follow a period of active development work, extending over several years, during which several shafts have been sunk and numerous levels run. These explorations have disclosed the presence of a very large body of zinc blende, rich in metal content.

The ore is to be treated by a new method of wet concentration, which is especially adapted to the mineral of the property. The experimental use of this process to date has been highly successful. A mill with a capacity of 50 to 75 tons of crude ore now is being constructed and is in the final stages of completion. A shipping product, analyzing 55 per cent in zinc, is expected to be obtained by treating 2 tons of crude ore to yield 1 ton of concentrates. Iron pyrites, which exist in the mineral in large quantities, also will be recovered commercially.

Experts have pronounced the property one of the most important zinc deposits yet discovered in the eastern part of the United States. T. I. Crane and W. S. Pilling, both of the firm of Pilling & Crane, Philadelphia, iron and steel merchants, are president and secretary and treasurer, respectively, of the Northern Ore Co.

Banner Year for Detroit

At the Detroit Foundrymen's Association's annual meeting and banquet at the Cadillac hotel, Thursday evening, May 14, the following officers were elected: President, A. F. S. Blackwood, Michigan Steel Casting Co.; vice president, Robert Carolin, Robert Carolin Brass Co.; secretary, Wm. A. Fletcher, American Blower Co.; treasurer, E. I. Chase, Cadillac Motor Car Co. Members of executive board:—H. W. Johnson, Fairview Foundry Co.; J. A. Moore, American Blower Co.; Edw. Bierwith, Russel Wheel & Fdy. Co.; J. W. Collins, Aluminum Castings Co.

E. J. Woodison acted as toastmaster and introduced several novelties in the way of entertainment features. The reports of the secretary and treasurer showed that the association was in a very healthy and prosperous condition, the year just ending being a banner year in the way of attendance, new members and high standard of papers read at the meetings.

In Market for Equipment

The machine shop, stock room and offices of the Ocala Iron Works, Ocala, Fla., were destroyed by fire on May 11, the loss being $60,000, including all records, files, etc. The company will rebuild its machine shop and is in the market for the following machinery: Forty-inch and 72-inch boring mills, 5-foot radial drills, 12-inch, 18-inch, 24-inch and 36-inch lathes, milling machines, shapers, planers, pipe machines, key-seating machines, bolt cutters, drill presses, emery wheels and a full line of small machine shop tools.

Not Operate Furnace

D. M. Barringer, of Philadelphia, president of the Texas Iron Association, has notified Gov. Colquitt, of Texas, that his association intends to forfeit its contract with the state of Texas for the operation of the iron mines and blast furnaces at Rusk. The association took over the iron industries of the state several months ago and has expended a considerable sum in preparing the furnace and mines for operation. The reason ascribed to Mr. Barringer for abandoning the contract is that pig iron could not profitably be manufactured in Texas on account of the long haul on certain raw materials and necessary to bring the finished product to the market.

Will Build Jones Furnace

Organized to erect and operate at Marquette, Mich., a step-process furnace, the invention of John T. Jones, of Iron Mountain, the New Metals Process Co. has been incorporated under the laws of Illinois with capitalization of $25,000. John H. Lee, of Chicago, is the president. John T. Jones is the general manager. The contracts for the plant have been closed. Mr. Jones is on the ground and work on the buildings has commenced.

The men who are back of the new furnace are trustees for the process and its use. They are J. M. Longyear, Marquette, and Henry L. Higginson, of the banking firm of Lee, Higginson & Co., and Seth T. Gano, of Boston.

Conviction

That Better Times Are Coming is Growing

New York, May 20. (By wire.)—Leading steel makers continue to note the increasing conviction in the trade that the industry is approaching more general activity in the near future, but still there are few tangible developments in new business to demonstrate such change.

Buyers are able to get deliveries as they choose, hence orders for future requirements remain small. There is slight improvement in tubes. Boiler and seamless have been the best for several weeks, but oil country goods are slow and there is considerable price cutting in line pipe. New business in wire is ahead of last month and specifications are fair. Automobile makers are buying sheets well, but otherwise the market is slow.

A good tonnage for re-export is the principal feature of the tin plate market, in which domestic orders are light.

Rail Orders Few

New York, May 20. (By wire.)—Rail orders of the United States Steel Corporation the past week were light, running only about 5,000 tons. The Chicago & Western Indiana gives the Illinois Steel Co. 2,000 tons additional and the Louisville & Nashville 1,600 more to the Tennessee Coal, Iron & Railroad Co.

Building Australian Works

Work is progressing upon the construction of the new steel works being erected at New Castle, New South Wales, Australia, by the Broken Hill Proprietary Co., plans for which were prepared by Jas. B. Ladd, 1412 Mutual Life Insurance building, Philadelphia. The work now under construction includes one of four 350-ton blast furnaces, eventually planned; three of ten 50-ton open-hearth furnaces; and a 35-inch blooming mill and a 28-inch rolling mill. As previously noted, David Baker, formerly a member of the engineering firm of Ladd & Baker, to which Mr. Ladd succeeded, is supervising the construction of the new works and will be general manager of the plant when it is completed.

Cyrus Currier & Son, Newark, N. J., intend to erect a new gray iron foundry but no definite time has been set for the beginning of this work.

THE ABC OF IRON AND STEEL

Making Bessemer Steel

BY JOHN HOWE HALL

BEFORE Sir Henry Bessemer's invention of the process that bears his name, steel could be made either by cementation (complete case hardening) of puddled or charcoal iron, or by melting cemented bar, or a mixture of charcoal iron and pig iron in crucibles. The raw materials for these processes were costly and the expense of conversion into steel was great. Bessemer's object was to devise a process by which pig iron, which was produced from the ore on a large scale, and hence at low cost, could be rapidly and also cheaply converted into steel. Pig iron, of course, is an alloy of metallic iron with varying percentages of other elements, of which the most important are carbon, silicon, manganese, sulphur and phosphorus. Of these, pig iron ordinarily contains from 3.5 to 4.5 per cent of carbon, from 0.30 to 5 per cent of manganese, and from 0.50 to 3 per cent of silicon. The problem confronting Bessemer was to convert this cheap, but impure, metal to iron containing say 0.10 per cent each of carbon, silicon and manganese; and to do it at small expense.

It was known that in the charcoal hearth and the puddling furnace, the carbon, silicon and manganese are eliminated from pig iron by converting them into their oxides, the carbonic oxide escaping as gas, the oxides of silicon and manganese forming a slag. The oxidizing agents used in those processes are iron ore, and the excess oxygen of the flame of the furnace. Bessemer's scheme consisted of blowing air through a molten bath of pig iron in order to oxidize the metalloids rapidly, rely-

The following articles of this series previously have been published in THE IRON TRADE REVIEW: "Iron Ore and Mining Operations," Jan. 5; "Beneficiating Iron Ores," Feb. 2; "Rules for Figuring Penalties and Premiums on Lake Superior Iron Ores," March 9; "Transportation of Iron Ore on the Great Lakes," March 16 and April 13; "Ore-Handling at Lower Lake Ports," Oct. 12, 1911; "The Manufacture of Bee-Hive Coke," Jan. 4, 1912; "Pig Iron and Its Method of Manufacture," Jan. 2; "Manufacture of Wrought Iron," Feb. 6; "Manufacture of Crucible Steel," April 3 and April 10; "Manufacture of Open-Hearth Steel," May 15, 22 and 29, June 5 and 12; "The Rolling Mill Industry," Aug. 7, 14, 21 and 28; "Wire and Wire Rods," Oct. 2, 9, 16, 23 and 30, 1913.

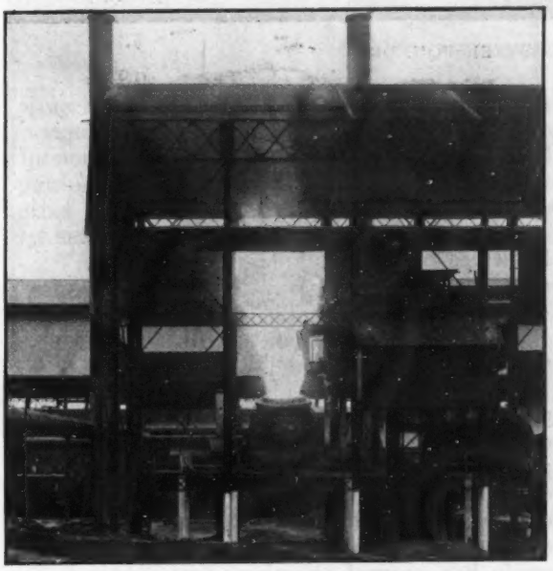


FIG. 1—BESSEMER CONVERTER IN ACTION

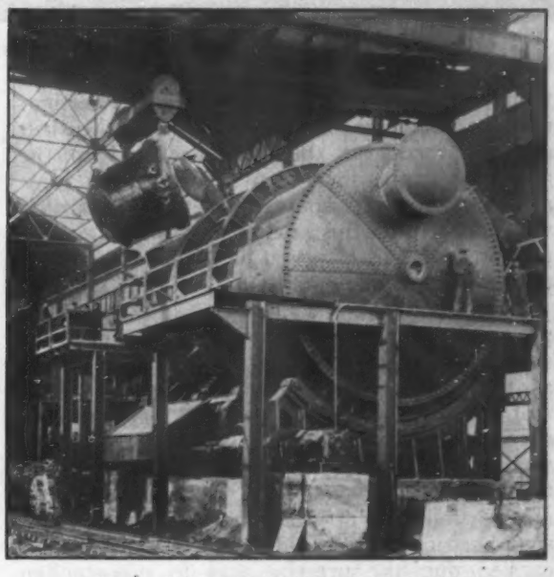


FIG. 2—ONE THOUSAND TON MIXER

ing upon the heat produced by their combustion to raise the temperature of the bath enough to maintain it fluid at the end of the process, when its melting point is highest. Tradition has it that the first blow was a lively affair and provided diversion for the onlookers.

Not Successful at First

Though the process produced practically pure iron in a fluid condition, yet at first it could not be called completely successful. The metal was so wild that the ingots poured of it were full of blow-holes and unfit for use. For a time, the metal was granulated by pouring it into water, and then remelted in crucibles.

The process, nevertheless, was introduced in many places, and tried with varying success. In Sweden it appears to have worked well from the start, and it is said that investigation by engineers, among whom was Mushet, of the process as there handled, led to the adoption of the final step necessary for complete success. Accounts differ in awarding the credit for this discovery; but for the purposes of this paper it is sufficient to state that it was made.

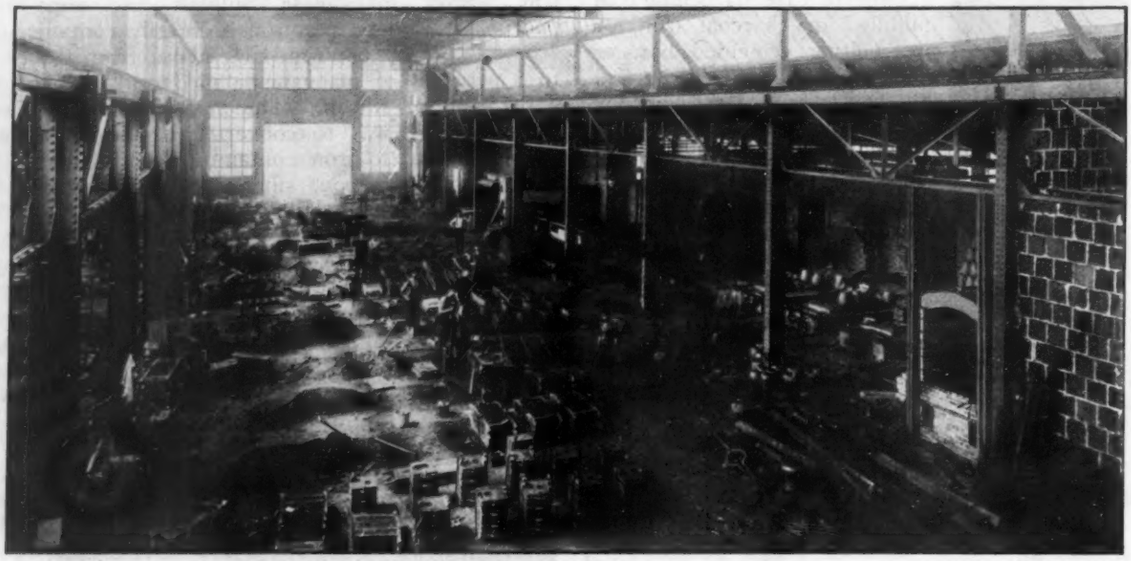


FIG. 3—A CONVERTER STEEL FOUNDRY

Briefly, it was found that the Swedish pig iron contained a great deal of manganese, sometimes as much as 5 per cent; and that as the blowing was stopped when the metal still contained some 0.50 per cent to 1 per cent of carbon, a good deal of manganese was also retained. It was thought, rightly as it proved, that by adding manganese to the wild blown metal produced in the English shops, quiet, sound-setting steel could be made. As finally carried out, the practice was to mix molten spiegeleisen, containing some 10 to 20 per cent of manganese and some 5 per cent of carbon, with the carbonless blown metal, and so add at one step, the manganese and the desired percentage of carbon.

This added manganese, as was soon found, has two useful functions. The first is its deoxidizing action; the second, its effect in counteracting the injurious influence of sulphur. In the elimination of the metalloids from pig iron by the Bessemer process, they are oxidized in the order of their relative chemical affinities for oxygen, at the existing temperature. The silicon is first removed, then the manganese, then the carbon. Naturally, the periods of elimination of each overlap, as the less oxidizable begins to burn, not when the more oxidizable is completely gone, but when it is largely removed. Now, iron is also oxidizable, and is burned to a certain extent throughout the process; and when the carbon, silicon and manganese (all of which are more oxidizable than iron at Bessemer temperatures), are nearly eliminated, the oxidation of the iron becomes considerable. The resulting oxide of iron is absorbed by the molten bath, and is chiefly responsible for the wildness of Bessemer blown metal.

Some Iron Permanently Oxidized

It is no doubt a fact that near the tuyeres much iron is oxidized at all stages of the blow. Most of the iron oxide produced early in the process, however, is promptly robbed of its oxygen by the silicon, manganese and carbon present, and only the iron oxide which succeeds in reaching the lining of the vessel and combining with its silicon, or in reaching the slag, is permanently lost. Even when the iron oxide has entered the slag, some of it is no doubt reduced again by the metalloids, if its

proportions in the slag exceed a certain figure. Having a greater affinity for oxygen than has iron, the manganese of the spiegel removes the oxygen from most of the dissolved iron oxide, returning the iron to the bath as metal, and being itself converted into manganese oxide, which is not soluble in molten iron, and hence largely enters the slag.

Sulphur in the blown metal exists mostly as iron sulphide. This compound has a strong tendency to form films between the crystals of the iron, which cause weakness and brittleness of the metal when hot. This phenomenon is known as red shortness. When manganese is added to the blown metal, much of the sulphur is taken from the iron sulphide to form manganese sulphide, just as the oxygen is taken from the iron oxide. Of the manganese sulphide so formed, a part floats to the surface of the bath, where the sulphur is largely volatilized as sulphur dioxide and a part remains suspended in the metal. It does not, however, form films between the crystals of the steel to anything like the same extent as does iron sulphide, but exists as rounded globules; hence it does not cause red-shortness.

Thus, by the addition of sufficient manganese to the blown metal, the dissolved oxide of iron is almost all reduced, and the influence of sulphur is counteracted. Generally, a liberal margin of manganese over and above that necessary to perform these two functions, is added to the steel. In 1856, Bessemer read his paper on "The Production of Pure Iron Without Fuel", and described the process in its completed form.

In the Bessemer process as first developed, no phosphorus or sulphur are removed from the steel; indeed, owing to the loss of carbon, silicon, manganese and some iron, there is even a slight gain in the percentage of these harmful impurities, since the same total weight of them remains, in a reduced weight of metal. The pig iron, therefore, must contain no more sulphur or phosphorus than is allowable in the steel. For commercial purposes, this limit is 0.1 per cent.

The basic Bessemer process was worked out to provide a cheap and rapid method of steel making that should at the same time be a de-phosphorizing method. In order to eliminate the phosphorus from the steel, the slag must be strongly basic, that is, it must contain a large excess, for instance, of oxide of calcium or magnesium. In the basic process, burned lime is charged into the vessel with the pig iron in order to provide this basic slag; and the metal blown is of low silicon content, so that the amount of lime needed to satisfy the silica resulting from the oxidation of the silicon, and to provide an excess of base, may not be too great. If higher silicon pig were blown, the cost of the lime thus made necessary would be considerable, and the volume of the slag produced would be excessive.

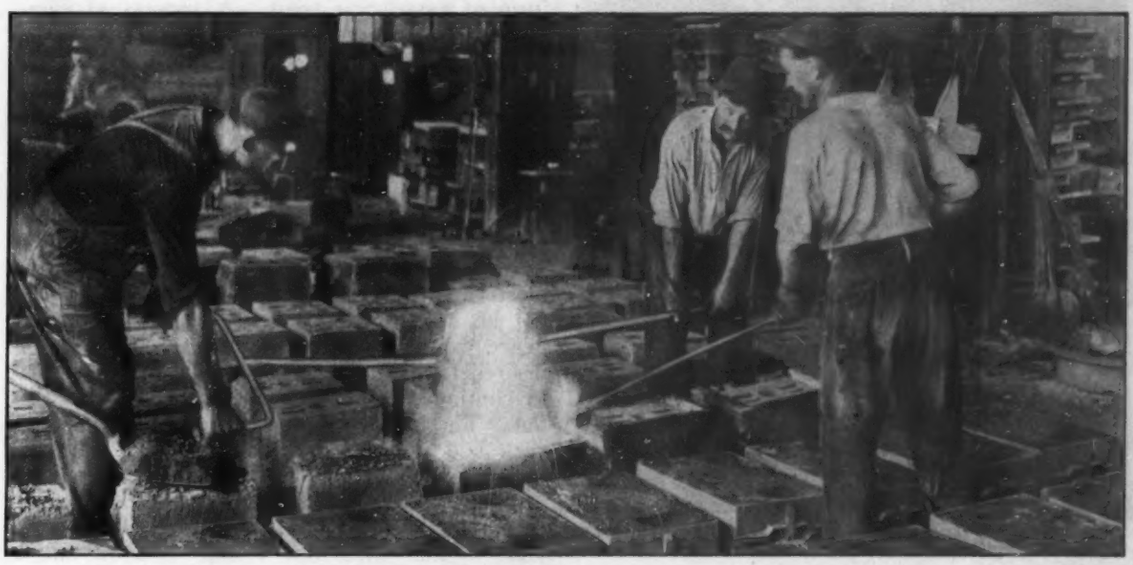


FIG. 4—POURING CONVERTER STEEL INTO MOLDS

In order that the slag may remain basic, the lining of the converter is of dolomite, calcined magnesium limestone. Should the vessel be lined with ganister (a siliceous material), such as is used for the ordinary Bessemer process, the slag would absorb so much silicon from the lining as to become non-basic; and the lining would be rapidly corroded away.

In blowing with basic slag and lining, the sequence of events is practically the same as in the ordinary process, up to the point where carbon is eliminated; the chief difference being the retention by the metal of part of its manganese. Then, instead of the iron starting

to burn, the phosphorus, which at the temperature of the vessel has a greater affinity for oxygen than has iron, is converted to its oxide. This oxide then unites with the lime of the slag to form phosphate of lime, which under the conditions existing is a stable compound. At the same time, some sulphur is eliminated from the metal. When the phosphorus is all burned, the blowing is stopped.

This elimination of phosphorus as a phosphate is impossible in the acid process, since iron oxide is the only base present to unite with the phosphoric acid to form a phosphate; and any phosphate of iron that might form would be at once broken up by the silica, producing silicate of iron and leaving the phosphoric acid unprotected. The manganese and carbon of the bath and of the recarburizers

FIG. 5—MOUTH OF OLD CONVERTER

would reduce this phosphoric acid and return the phosphorus to the bath.

In the ordinary process, the bulk of the heat is obtained from the combustion of the silicon. Basic pig, however, contains only about 0.5 per cent of this element. The combustion of so small an amount of silicon as this would not provide sufficient heat to make the metal hot enough to pour well. Some other heat-producing element is, therefore, needed, and the one used is phosphorus, the very element that the process is designed to remove. In order that sufficient heat shall be provided by the combustion of the phosphorus, this element in the pig iron is purposely made as high as it is possible to have it, without unduly prolonging the after blow, as the phosphorus-eliminating period that follows the elimination of carbon is called. In practice, pig iron containing some 2 to 3 per cent of phosphorus is used. The highly phosphoric slag produced is sold to manufacturers of fertilizer. The greater cost of lining materials and the larger loss of iron in conversion, make the basic process more costly than the acid. Hence, cheap high-phosphorus pig iron is essential to the success of the process. In America, high-phosphorus pig irons cannot be obtained cheaply enough to enable the basic process to compete successfully with the acid, so that all attempts to introduce it have proved futile. On the continent of Europe, the process is very widely used.

Construction of the Converter

As we have seen, no fuel is burned to heat the metal in the vessel, except the impurities of the iron. The vessel, therefore, is not a furnace but a container, lined with refractory material, and provided with openings called tuyeres, through which the air is blown. In the early experiments, nearly every conceivable form of vessel was tried. A process of elimination of the unfit led to the adoption of the present form, which is, briefly, a cylindrical vessel of steel plate, lined with refractory material, closed at the bottom, mounted upon trunnions, and provided with a number of tuyeres in the bottom for the introduction of the blast. The rotary feature was adopted to enable the blowing to be stopped at exactly the moment desired, since it was found that a stationary vessel provided with a tap hole was most unsatisfactory. The hole often could not be opened exactly at the proper moment, hence the blowing could not be stopped at the desired time; and in any case it was necessary to continue blowing till the metal had all run out. The lining, which is generally of siliceous rock laid in slabs and plastered with siliceous ganister, was found to corrode most rapidly around the tuyeres. To facilitate repairs, therefore, the bottom is made readily removable, so that when one bottom is worn out, a spare one, ready for use, can be substituted in a few minutes, and operations resumed.

The tuyeres are cylindrical clay bricks, each pierced with a number of openings, and extend from the plate which covers the windbox to the surface of the refractory bottom. The bottom is lined in part with the same material as that used for the body of the vessel; and the space around the tuyeres is filled with large bricks set on end, and with ganister tamped in place with hot molders' rammers.

The number of tuyeres is such that the combined area of their openings is about 2.5 square inches per ton of charge. It was found that if large openings and rather low blast pressures are used, the air passes through the bath in large bubbles; while by the use of smaller openings and higher pressures, the air is broken into a spray, and so is brought into more intimate contact with the metal. The blast is taken in at one trunnion and led to the wind box below the bottom by suitable

pipes. A large blowing engine supplies the blast at a pressure of from 10 to 30 pounds per square inch, and in sufficient volume for the purpose.

The vessel is charged when in a horizontal position, the pig iron being run in by means of a spout. The blast is then turned on, and the vessel brought to a vertical position, when the pressure of the air rushing up through the tuyere openings prevents the metal from running through the tuyeres into the wind box. When the blowing is finished, the vessel is turned down to a horizontal position, and the blast shut off. The metal is poured into the ladles by tipping the vessel down still more.

The vessels first used were small, but the increase in size was rapid. The typical plant today has three converters of from 10 to 20 tons capacity. Of these, one serves as a spare, and two are used at a time, one blowing while the other is being poured and recharged.

Obtaining a Uniform Mixer

In the early shops, the pig iron was melted in large cupolas, at, of course, a considerable expense in fuel. Efforts to use liquid metal direct from the blast furnace were for some time unsuccessful, owing to the variations in the composition of the iron from tap to tap, which made it very difficult to blow the successive charges to a uniform temperature. The invention of the mixer solved the difficulty. This is a tilting furnace of very large capacity, often, though not always, provided with regenerators, into which the successive ladles of pig iron from the blast furnace are poured and from which the metal is drawn as needed for the converters. Enough fuel is burned in the mixer to keep the iron hot, and unless the average composition of the successive taps from the blast furnace varies very widely, the metal is brought to the vessels at a sufficiently uniform composition to enable the blower to control his process as he wishes. Another advantage of the mixers is that by holding the pig iron liquid, some of its sulphur floats out as sulphide of manganese. This sulphur is volatilized and so eliminated.

The spiegeleisen for recarburizing was at first melted in reverberatory furnaces. Cupolas, however, are now almost always used for the purpose, as they do the work at the lowest possible cost.

In the general arrangement of the shop, the mixer is placed at a high enough level so that it can be poured into a transfer ladle discharging into a spout, through which the metal is run into the converter. The spiegel cupolas are also elevated so as to tap into spouts through which the recarburizer is run into the vessel. The converter itself, in turn, is at such a level that the steel ladles can readily be filled from it. These ladles, in the early Bessemer plants, were generally carried by jib cranes, and the casting pits were made circular. With the development of electric cranes came the use of straight line casting pits, located farther from the vessels than was possible with the old jib cranes. Today, casting on cars has been substituted for pit casting in almost all the shops. The ladles and ingot molds are of the usual type, and do not require extended description. The process is so rapid, 10 minutes being the usual time of a blow in America, that many molds and ladles are required. There is, however, an advantage in this rapid work from the point of view of the ladle men, since a skull in a ladle need not always be removed but can be left in and melted out by the next heat, which is then purposely blown rather hotter than usual.

FIG. 6—THE FLAME AT ITS HEIGHT

In most American shops, the pig iron blown contains less than 0.5 per cent of manganese, and about 1 per cent of silicon. The vessels and ladles are kept so hot by rapid working that the amount of heat that has to be supplied by the combustion of the metalloids is a minimum. To guard against skulling the transfer ladles, and against a possible cold blow, the silicon is generally made a little higher than necessary, and the temperature of the blows kept down by charging cold steel scrap, such as crop ends, to the converter before blowing starts.

Blowing

When the converter is first turned up, the oxygen of the blast is all consumed in the oxidation of silicon and manganese, so thaf only the nitrogen passes through the metal. There issues from the mouth of the vessel, therefore, only sparks and small particles of slag, and no true flame is formed. At this period of the

blow, estimation of the temperature of the metal is difficult.

When the silicon and manganese are nearly gone, the carbon begins to burn. It is converted to carbon monoxide by the blast, and this gas passes through the vessel with the nitrogen, and takes fire at the mouth, producing an intensely bright flame. Small at its first appearance, this flame rapidly increases in size until it reaches its full height. When the carbon is all burned, the flame drops quite sharply, the signal to turn down the vessel and shut off the blast.

By the brilliance of the flame it is possible for the skilled blower to judge of the temperature of the metal; since, naturally, the hotter the metal, the hotter the gas generated in it; and the hotter this gas when it reaches the air, the greater the temperature and brilliance of the flame. In many shops, arrangement is made for admitting steam to the wind box by means of a valve under the blower's con-

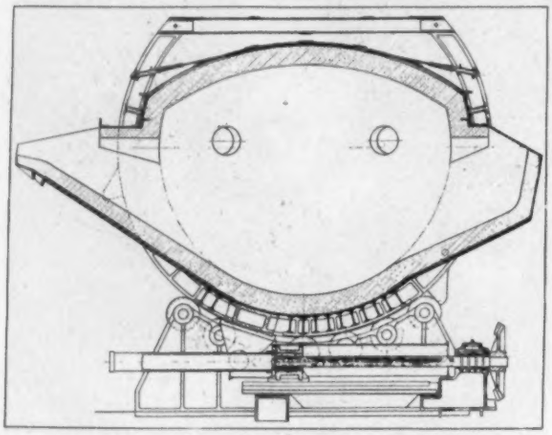


FIG. 7—SECTION THROUGH A MIXER

trol, for the purpose of cooling metal that blows too hot. The steam, carried through the metal with the blast, is dissociated by the great heat into its component gases, oxygen and hydrogen. This dissociation requires a great deal of heat, which is absorbed from the metal, and, therefore, cools the bath considerably. Should not enough scrap have been charged to the vessel to cool the metal, this method is generally resorted to.

Should the metal blow too cold, the vessel is tilted forward to an extent sufficient to bring one or more tuyeres close to or just above the surface of the bath, and the blowing is continued for a few moments in this position. The air passing over the surface of the bath oxidizes a considerable amount of iron, which is promptly absorbed by the slag, the heat of oxidation of the iron greatly increasing the temperature of the metal; this process also burns some of the carbonic oxide to carbon dioxide *inside* the vessel, thus taking advantage of the heat of combustion of the carbonic oxide to heat the bath, instead of the surrounding atmosphere.

In American practice, the heats are blown in less than ten minutes, owing to the small amount of metalloids to be oxidized. As the manganese in the pig is so low, the slag consists largely of silicate of iron and is quite sticky, owing to the excess of silica it contains. Higher manganese in the pig increases the proportion of oxide of manganese in the slag, and makes the latter more fluid. Should it be too fluid, it frequently slops over the mouth of the vessel to a considerable extent. This is as far as possible prevented by slacking down the blast pressure.

Practice in England and the continent of Europe differs from ours chiefly in the less rapid work, necessitating higher silicon in the pig and longer blows; and in some cases in the use of pig iron containing much more manganese than is blown in America. As has been said, in Sweden, where small vessels are quite generally used, this is carried so far as to use pig irons in which the manganese much exceeds the silicon, so that the heat of combustion of the manganese is largely substituted for that of silicon, and very watery slags are made. These slags are more severe upon linings than the more siliceous slags common in America.

When these high manganese pig irons are blown, the carbon starts to burn before the manganese is all eliminated; and as the blowing is stopped when the metal contains about the amount of carbon that is desired in the finished steel, enough manganese is retained to make the addition of large amounts of spiegel or ferro-manganese unnecessary. The uncertainty of this method has not commended its use elsewhere.

In some of the German plants, very high silicon pig iron is blown, so that the metal becomes so hot, before all the silicon is eliminated, that it reaches the temperature at which the affinities of silicon and carbon for oxygen are reversed. The carbon then starts to burn before the silicon is all eliminated, so that a certain amount of silicon is retained by the metal at the drop of the flame. This silicon helps to quiet the metal in the molds.

With these exceptions, the metal is generally blown down to about 0.1 per cent of carbon, silicon and manganese and these constituents are brought to the desired point by additions of pig iron, spiegeleisen, ferro-manganese, ferro-silicon, etc. Bulky additions of pig iron or spiegel, needed for the production of high carbon steel, are usually pre-melted. For the production of low carbon steel, high percentage ferro-manganese or ferro-silicon are used, and are generally thrown into the vessel in lumps. Sometimes coke or hard coal is put into the ladle when the alloys used to give the necessary

amount of manganese do not provide enough carbon.

In the steel foundry, especially for the production of very light castings, the Bessemer process has found a special field of considerable importance. For this work, however, the converter has been developed along somewhat different lines from those followed in the evolution of the process for merchant steel making.

The large vessel has from the first been used to a certain extent for the production of steel castings. For small work, however, the rather low temperature of the steel and the large amount of metal to be poured slowly into many castings, proved a serious obstacle to the success of the process. Small vessels, therefore, were soon seen to be necessary to success in this field.

The process, moreover, as usually carried out, was found not to be suited to the production of very hot steel in small vessels. The metal, even when the silicon of the charge was made very high, was often not hot enough to pour the castings successfully.

To overcome this difficulty, Walrand and Legenisel, two French metallurgists, invented a process patented in America in 1893, the distinguishing features of which were the addition to the bath, after the ordinary blow was nearly completed, of a considerable amount of molten ferro-silicon; and an after blow to oxidize this silicon. According to the patentees and to those who used the process, the heat produced by the oxidation of this silicon is much more completely absorbed by the metal than is the heat of combustion of the same amount of silicon contained in the initial charge or added early in the carbon-flame period; because when the silicon is added near the end of the blow, there is so little carbon monoxide generated during its combustion as to absorb but a small proportion of the heat produced.

The combustion of this added silicon, of course, produces no flame, so that it is difficult to tell when the silicon is all burned. In order to provide an end point, it was customary, in the use of this process, to stop the first blow and add the molten ferro-silicon when the metal contained a little over 1 per cent of carbon. The after blow then consisted of two parts, a flameless period during which the silicon was burned and the metal greatly increased in temperature, and a short period when the remaining carbon was burned, with, of course, the characteristic flame, which dropped in the ordinary way when the carbon was eliminated.

Modifications of this method of using silicon have since that time been used in many shops. The ordinary type of converter in small sizes, however, has now been largely superseded, at least in America, by the side blow, or surface blow vessel.

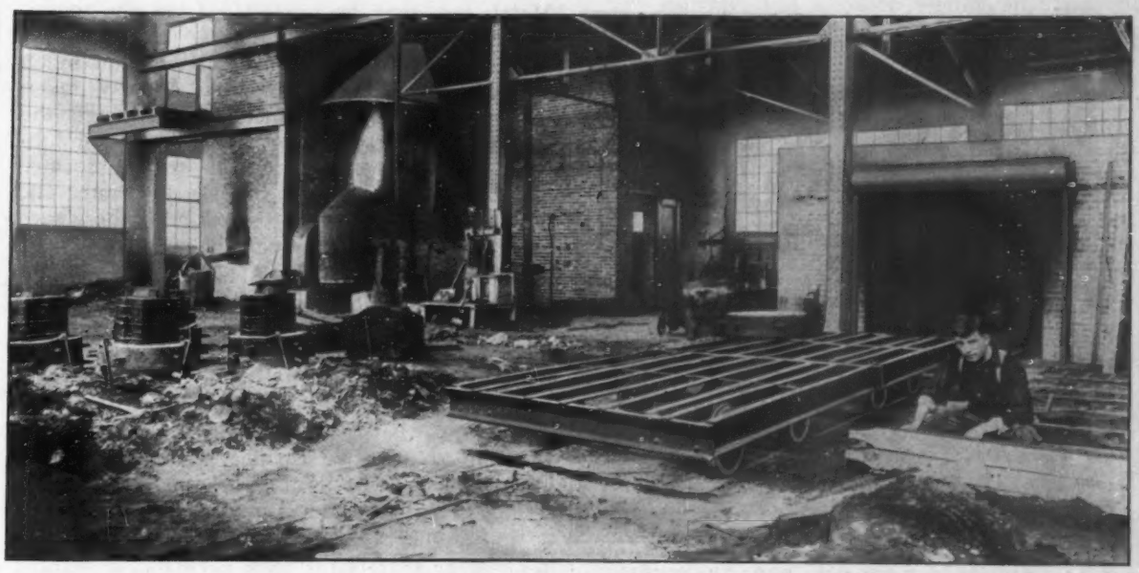


FIG. 8—A CORNER IN A CONVERTER FOUNDRY

The Side Blow Converter

The invention of surface blowing dates back to the early days of the process. In many of the vessels designed by Bessemer, the blast was applied at or near the top of the bath. The heavy oxidation losses of iron rendered the adoption of the type inexpedient; though, as we have seen, the principle has often been used in ordinary vessels, in tilting the converter and blowing for a while at the surface, in order to warm up a cold blow.

For small castings, however, it was so essential to have very hot metal that side blowing commended itself strongly to metallurgists, in spite of the increased loss of iron. Many types

of vessels, blown at or just below the surface, have been used. At present, the converters are all very much alike. The bath is generally quite deep, and the air is introduced at about four pounds pressure through a row of large tuyeres at the surface of the bath.

The wear of the lining at the tuyeres of these vessels is quite rapid, even more so than in the ordinary type of vessel, because the slag is in contact with the tuyeres; and hence lining repairs have to be made quite often. Some designs of side blown vessels, therefore, can be run only every other day, and two or three vessels are needed if steel is to be made every day. Many of the special features of design that have been introduced contemplate so facilitating repairs that metal can be blown every day in the same vessel.

The equipment of a side blown vessel is cheaper to install than that of a vessel of the

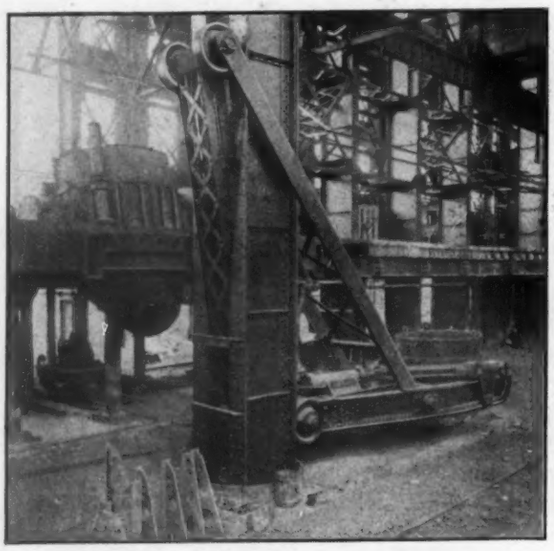


FIG. 9—REVOLVING CRANE FOR TRANSFERRING METAL FROM CONVERTER TO MOLDS

ordinary type, because a positive pressure blower is used to provide the blast, instead of a blowing engine. Cupolas are used to melt the charge, and sometimes cupolas or other furnaces are provided to melt the recarburizers.

The Blow in a Steel Foundry

A mixture of pig iron, foundry scrap, and sometimes other scrap, is charged to the cupolas, such that the metal tapped shall contain about 2 per cent silicon and not over 0.5 per cent or so of manganese. The history of the blow is somewhat different from that of the ordinary bottom-blown type of vessel.

Just so much metal is charged that when the upper surface of the bath is at the level of the bottom of the tuyere openings, the vessel is inclined forward away from the tuyeres, at an angle of some 6 to 8 degrees. This is ascertained by sliding off the cover of the wind box and looking through the tuyeres as the vessel is tipped slowly back by means of the hand wheel. When the proper quantity of metal has been charged, the vessel is tipped forward 1 or 2 degrees beyond the above-mentioned angle, so that the blast shall strike at about the center of the bath. The blast is then turned on, at a pressure of from two to four pounds.

For some minutes only an increasingly dense mass of sparks pours from the vessel's mouth. Then a faint flame appears, much like the first stages of the ordinary Bessemer flame. On thus getting a light, as it is called, the vessel is turned a little nearer the vertical, when the flame somewhat increases in length.

A few minutes later the flame lengthens out considerably, and a boil takes place. The metal and slag are strongly agitated, and often slag is thrown out in considerable amounts. Metal, too, may be projected from the vessel, resulting in considerable loss. To prevent too violent boiling, the blast is reduced as much as possible; but it cannot be entirely taken off, lest the slag and metal run through the tuyeres into the wind box. The boil soon subsides, and the flame returns to its former length. After longer or shorter intervals, other boils may occur—sometimes there are as many as five in a single blow.

As the volume of the bath is diminished by the loss of the metalloids, the vessel is turned nearer and nearer the vertical, in order to keep the blast striking in the same place, well out toward the center. Should so much metal be projected during a boil that the bath is too far below the tuyeres, the flame cannot be maintained even by turning the vessel up to the vertical. In that case the blowing is stopped, and a little more metal charged.

The final period of the blow, which begins after one or more boils have occurred, is marked by the final flame. This is a long, feathery flame, much like that of the ordinary Bessemer vessel, and lasts for one or two minutes, then drops quite sharply, indicating that the carbon is eliminated. The vessel is then turned down and the blast shut off. The total time of a blow varies from 15 to 30 minutes.

The blast in these vessels evidently oxidizes the metalloids from a comparatively shallow layer of the surface metal, producing a highly siliceous and sticky slag; and then oxidizes much iron from this layer, raising the content of the slag in oxide of iron. The slag presently becomes fluid and highly oxidizing; and diffusion from the underlying layers of the bath into the surface layers then raises the carbon content of the metal in contact with this slag to a point where a reaction between the carbon and the iron oxide begins, with the production of carbon monoxide. This is the beginning of the boil. Soon the whole bath is in a state of agitation, and carbon

monoxide is formed until the iron oxide content of the slag is reduced so much that the reaction is no longer possible. The boil then subsides, and the same sequence of events begins again.

If much manganese be present in the pig iron, the manganese oxide resulting from its oxidation so increases the fluidity of the slag that the boils are very violent, and much metal is thrown out and lost. This is why only low manganese metal is blown.

The recarburizing practice is much like that followed in ordinary Bessemer work. The recarburizers may be added solid in the ladle, or better in the vessel. Whenever possible, however, especially if heavy additions are made, they should be pre-melted, as their deoxidizing effect is then undoubtedly more complete. If used molten, they can be mixed with the blown metal in the ladle, or perhaps better in the converter.

As has been said, the pig iron for the ordinary Bessemer process must contain less than 0.1 per cent of phosphorus and sulphur. This means, roughly, that the ores from which this pig is made, must contain less than 0.05 per cent of phosphorus, since two tons of ore make about one ton of pig iron, and all the phosphorus of the ore goes into the pig. The increasing scarcity of these ores has for some years past made it quite plain that the production of Bessemer steel can no longer continue to increase as it has in the past, and indeed that the maintenance of the present rate of production for many more years is almost out of the question.

For some time past, engineers have specified open-hearth steel for high-grade structural purposes, believing that its superiority to Bessemer steel is sufficient to justify its use wherever quality is important. Rails, however, were until a few years ago, almost invariably made of Bessemer steel. The increasing severity of traffic has necessitated the use of harder and harder steel for rails, and a few years ago a point was reached where the brittleness due to the high carbon of the steel, and to the necessarily rather high phosphorus content of Bessemer steel, became so great that breakage was unpleasantly frequent. As a remedy for this trouble, a demand arose for basic open-hearth rail steel, which can be made of low sulphur and phosphorus content from non-Bessemer ores, and hence is less brittle, for a given carbon content, than Bessemer steel. It was thought also that the use of open-hearth steel would improve the resistance of rails to the mashing down of the heads and other types of failure that have become familiar of late years. At present, a very large proportion of the rails produced are of basic open-hearth steel, and though the change has not by any means eliminated rail troubles, yet it is probable that the basic open-hearth rail has come to stay.

This condition of affairs has given a great impetus to the use of the duplex process. In this process, basic pig iron is blown in a Bessemer converter, in which the silicon and manganese and part of the carbon of the pig are quickly and cheaply eliminated, and the molten blown metal is then transferred to a basic open-hearth furnace, where the phosphorus and sulphur are eliminated to the desired degree. This procedure has several practical considerations to recommend it to steel makers.

First, it has in some cases enabled existing Bessemer equipment to be utilized, which would otherwise have been thrown out of service.

Second, it has made it possible to conduct the ordinary basic open-hearth process without the purchase of scrap.

Third, it has provided a means of greatly increasing the output of a given open-hearth plant, in good times, without the expense of installation of additional furnaces.

A battery of open-hearth furnaces, also, is made more flexible in output by the use of Bessemer converters and the duplex process, since it is possible to run all the furnaces upon blown metal, thus securing a maximum output when business is good; to run them on a pig and scrap basis, and thus keep them busy upon a reduced tonnage; or to run some of them on pig and scrap and enough of them on blown metal to keep one Bessemer unit busy, and thus secure an intermediate output. When working by the duplex process, the time

(*Continued on page 934b.*)

Production of Ingots and Castings, in Gross Tons.

Year.	Bessemer.	Open-hearth.	Electric.
1898	6,609,017	2,230,292	
1903	8,592,829	5,829,911	
1907	11,667,549	11,549,736	
1908	6,116,755	7,836,729	55
1909	9,330,783	14,493,936	13,762
1910	9,412,772	16,504,509	52,141
1911	7,947,859	15,598,650	29,105
1912	10,327,901	20,780,723	18,309

Recording Instruments

An instrument for recording all of the most important operating factors of a blast furnace on one chart, including blast temperature, gas temperature, blast pressure, number of charges, rate of charging and intervals of rest, recently has been perfected by the Uehling Instrument Co., Passaic, N. J., for use in connection with its pneumatic pyrometers. This allows all the records to be read at a glance, and permits easy and effective study of the different determinations, separately and in conjunction with one another. If related phenomena are recorded, the influence of one on the other, and conditions affecting one or several of the records, can be detected at once, points which might escape notice altogether if the records were on separate charts.

This instrument, known as the triple recorder and shown in the accompanying illustration, records these determinations with three graphs on a 12-inch chart. The pens recording the temperatures are actuated by steel bells floating in a bath of mercury which is contained in two cylinders. These cylinders are secured in a vertical position to the case of the recorder and connect with a double pyrometer. The pen recording the pressure is actuated by a column of mercury contained in the steel U extending below the body of the recorders, operating on the hydrostatic principle.

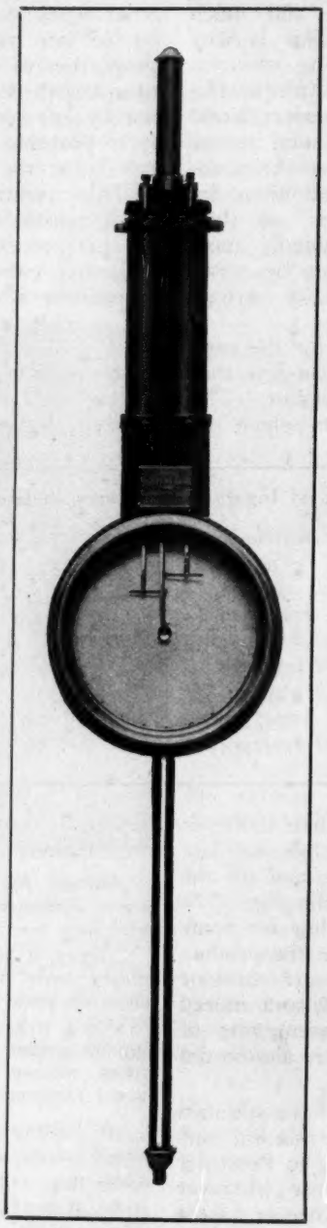
Additional information on this and other forms of multiple recorders is contained in a booklet recently issued by the Uehling Instrument Co.

Educating Apprentices

At the annual meeting of the Manchester Association of Engineers, at Manchester, Eng., on March 28, J. C. Maxwell Garnett, principal of the Manchester Municipal School of Technology, delivered an address on "The Education of Engineers", in which he outlined a system of engineering training. Mr. Garnett observed that the individual who was to receive the most highly specialized training should, in the interests of the community, first receive the widest general education.

Part-time classes to be attended by young apprentices should be held in the daytime, so that the evenings might be available for the essential private study. These evenings must not be used for working overtime. By following the Munich plan of employing seven apprentices where six are employed now on the same work, engineering firms would make it possible for each of their apprentices to spend one day a week in study without any consequent interruption of the work at the shops. Against the additional cost of paying a seventh apprentice was to be set off the increased output of apprentices who would no longer be tired by their evening classes.

In addition to requiring apprentices



UEHLING RECORDER.

to attend outside part-time courses, whether day or evening, it might be desirable also to give them formal instruction in the works on subjects of special interest in connection with the particular work upon which they were engaged. That American practice was followed by certain companies at Manchester.

After some further remarks on the encouragement of apprentices, Mr. Garnett went on to say that an apprentice who had had a good secondary education and had passed his matriculation examination before leaving school could now compete for a university scholarship, awarded by the Manchester Corporation, without being handicapped relatively to candidates fresh from school. In Manchester a university scholarship is no longer out of reach of the average boy engaged in industry.

The question whether the future engineer who was to follow a university course should enter his university as soon as he leaves school, or should spend some three or four years in engineering works between school and college, could not be answered in general terms. The answer depended on the school, on the works, on the college, and, most of all on the man himself.

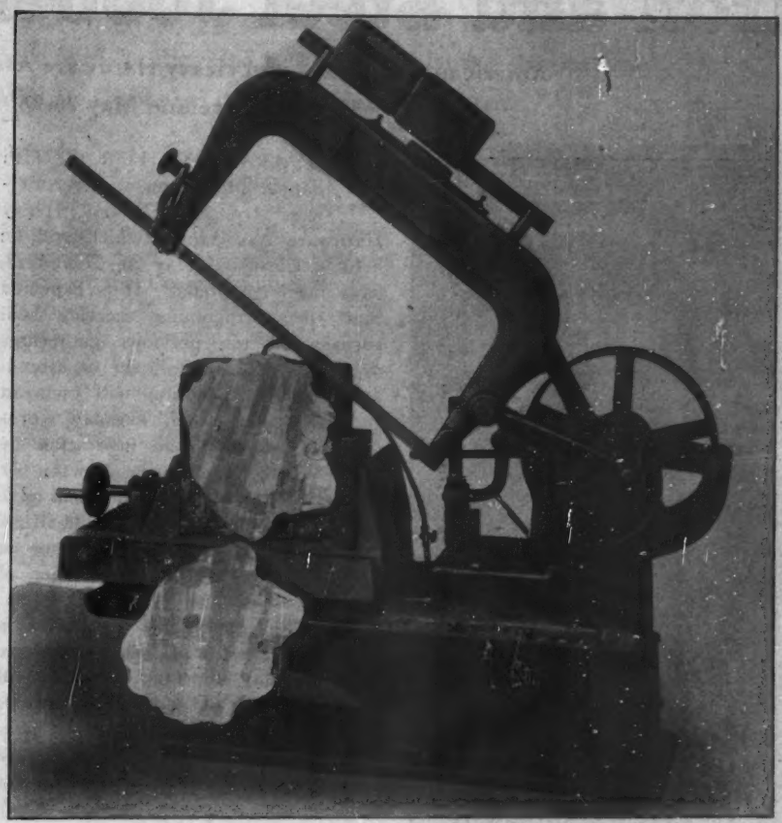
No system of engineering education could be satisfactory unless it was democratic, declared Mr. Garnett. The principle on which the award of scholarship should be based was that no person who, if he passed through a certain course, would be both needed and demanded to fill some place in the life of the nation, should be prevented from taking that course for want of a scholarship or maintenance allowance.

Sintering Process

A 14-page booklet issued by the Pittsburgh Metallurgical Co., Park building, Pittsburgh, describes a new sintering process devised by A. F. Plock. This process has been in operation at the works of the Ashland Iron & Mining Co., Ashland, Ky., for several months. The finely divided iron bearing material to be sintered is intimately mixed with the required amount of carbon to produce the sinter. This mixture is then moistened in a pug mill and deposited into sintering cars in a uniform layer. The upper surface of the mixture is ignited by an intense local heat generated by a furnace placed over the car. The combustion of the intermixed carbon is effected in a progressive downward course by a current of air forced in the same direction through the permeable mass. The energy from the combustion of each particle of carbon is utilized directly in sintering adjacent particles of iron-bearing material, agglomerating them into a coherent sinter. The booklet includes several tables giving analyses of the crude dust and the resulting sinter.

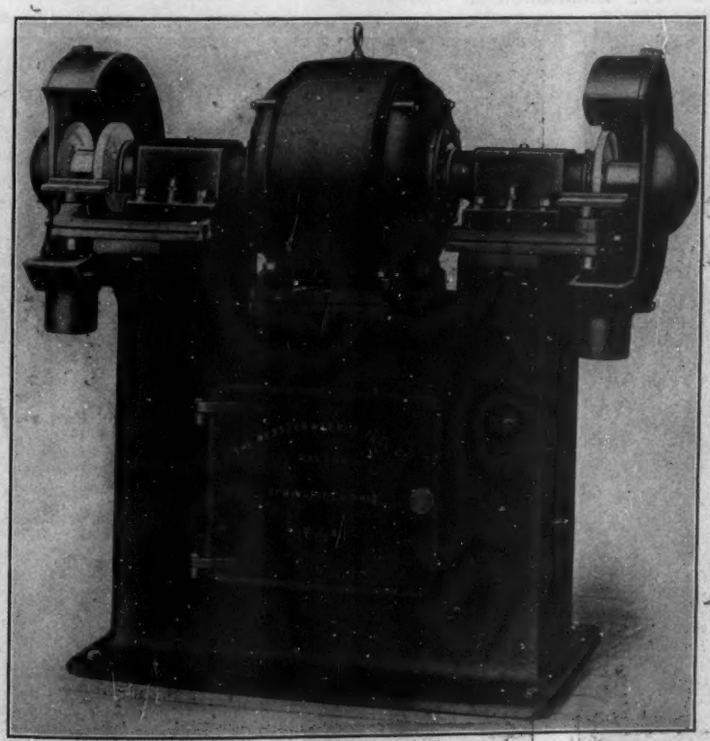
Power Hack Saw

The accompanying illustration shows a power hack saw developed by the Racine Tool & Machine Co., Racine, Wis. It is designed to operate on the draw-cut principle. The bed of the machine is a heavy casting with an oil pan all the way around to catch drippings. The mechanism for transmitting the power from the driving belt to the saw blade is simple and is designed to operate with the least possible loss of power. The work holding device is heavily constructed and the table is fitted with tee slots for clamping irregularly shaped pieces. The saw frame is a heavy casting suitably ballasted with movable weights. This machine has been found especially adapted to cutting meteorites. The illustration shows a nickel-iron meteorite which fell near Gibeon, German Southwest Africa. It was cut into slabs ¼-inch in thickness. The section of the meteorite was approximately 225 square inches and about 10 hours were required for the cuts.



HACK SAW CUTTING A METEORITE

The official chemist of the American Institute of Metals reports that an alloy of about 40 per cent cobalt and 60 per cent of tin is especially resistant to acids, but owing to its brittleness it has little commercial value. Experiments, however, show that admixtures of this alloy with other metals, such as copper, produce a series of alloys which can be turned, forged and machined and still have a high degree of chemical resistance.



ALTERNATING CURRENT, ELECTRICALLY-DRIVEN, FLOOR TYPE GRINDER

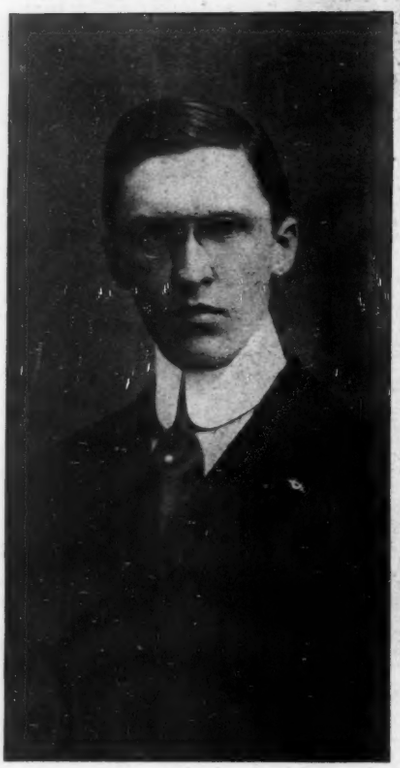
Electric Grinder

The Webster & Perks Tool Co., Springfield, O., is building an electrically-driven floor-type grinder, shown in the accompanying illustration, which is adapted to all kinds of grinding operations in casting plants. The rotor is wound on a hollow steel shaft mounted in a pair of ball bearings and the wheel spindle, or machine arbor, passes through this shaft, from which it is driven by a pair of dovetail steel keys. As the wheel spindle has a slightly smaller diameter than the opening in the rotor shaft, any deflection of the wheel spindle will not affect the rotor and thereby damage to the motor is eliminated. This type of construction also permits of the removal of the wheel spindle without disturbing the motor. The wheel spindle bearings are independent of the roller bearings and are mounted in self-oiling babbit bearings. The machine complete weighs 1,550 pounds and is equipped with a five-horsepower motor operating at 1,200 revolutions per minute. The machine has a capacity for carrying a pair of 16 to 18-inch wheels with 3-inch face.

The city of Norwalk, Conn., is to build a municipal electric lighting plant in East Norwalk at a cost of about $25,000.

Iron and Steel Jobbers Convene

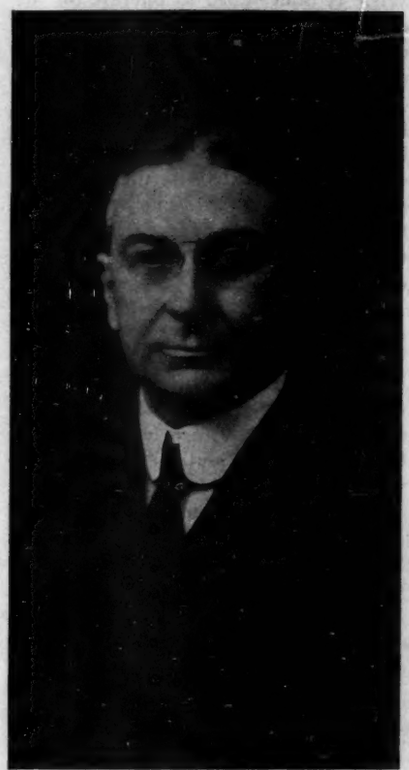
American Iron, Steel and Heavy Hardware Association Will Meet in Cleveland May 26-28



JOHN G. PURDIE
Secretary-Treasurer
American Iron, Steel & Heavy Hardware Association

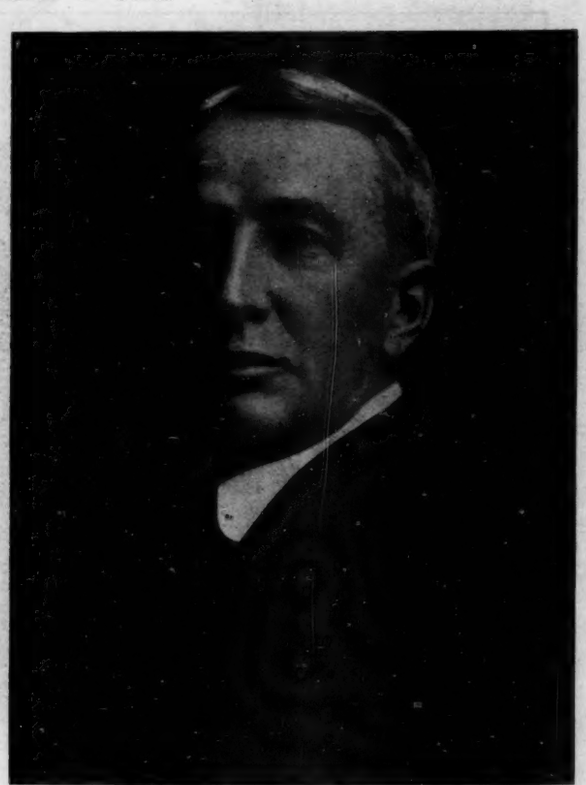
PREPARATIONS FOR the fifth annual convention of the American Iron, Steel and Heavy Hardware Association, which will be held in Cleveland May 26, 27 and 28, have been completed. It is expected that the forthcoming meeting will surpass all the previous gatherings of the association in point of attendance. The convention will open at the Hollenden Hotel, Tuesday morning, May 26, with an invocation by Rev. Worth M. Tippy. Newton D. Baker, mayor of Cleveland, will give an address of welcome in behalf of the city. An address of welcome in behalf of the Cleveland Chamber of Commerce will be given by M. A. Black. Responses will be made by E. P. Sanderson and Spencer Welton. The Tuesday morning session will conclude with an address by Homer H. Johnson, representing the Chamber of Commerce of the United States. On Tuesday evening there will be an executive session which will act on the reports of the secretary-treasurer, the executive committee, the spring and axle committee and the woodstock committee.

Charles E. Faeth, of the Faeth Iron Co., Kansas City, will present a paper on "The Elimination of Unrea-



F. H. BUTTS
Butts & Ordway Co., Boston
Member of Executive Committee

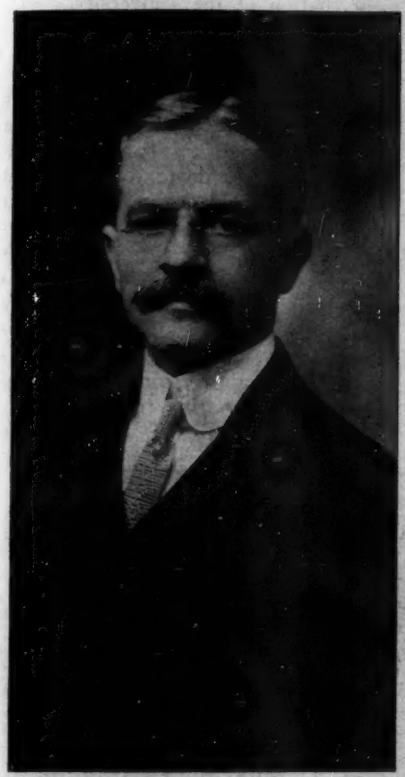
CHAS. E. FAETH
Faeth Iron Co., Kansas City
Ex-President of the Association



GEORGE E. ENOS
The Enos & Sanderson Co., Buffalo
Member of Executive Committee

All is Ready for Fifth Meeting

Elaborate Entertainment Will Be Provided by Cleveland Hosts—Important Subjects Will Be Discussed by Heavy Hardware Men



H. BODEVIN
N. Langler & Sons, Brooklyn
Member of Executive Committee

sonable and Destructive Competition" at the Wednesday morning session. This paper will be discussed by L. H. Williams, of the Williams Hardware Co., Minneapolis; Herbert Frela, of the Congdon-Carpenter Co., Providence, R. I., and Charles C. Lewis, of Springfield, Mass.

A paper on "Contract Relations Between Manufacturers and Distributers", which will be read at an open meeting Wednesday evening by Samuel L. Sewall, of the Minneapolis Iron Store Co., Minneapolis, will form one of the features of the convention. This paper will be discussed by J. P. Replogle, general sales manager of the Cambria Steel Co.; Frank Baackes, vice president of the American Steel & Wire Co., E. F. Yarnelle and James A. Coe.

The entertainment program has been carefully worked out, special features being provided for the ladies. From 4 to 6 p. m. Tuesday there will be a dansant at the Hollenden, followed by a ball in the evening. Wednesday afternoon the ladies will lunch at the Country Club, after which they will enjoy an automobile ride. A musicale will be given for the ladies on Wednesday evening.

W. H. GRANT
Bonniwell-Calvin Iron Co., Kansas City
Member of Executive Committee

E. P. SANDERSON
E. P. Sanderson Co., Boston
Ex-President of the Association

C. M. ROEHM
Roehm & Davison, Detroit
Retiring President

Wire Drawing Machine

A wire drawing machine to be used in connection with 22-inch, 24-inch, 28-inch and 30-inch drums for drawing steel wire, is shown in the accompanying illustrations. The machine is designed primarily for drawing steel wire from a ⅝-inch round down to any desired size. It can also be used for drawing copper and other precious metals. The machine is driven by a friction clutch, the driving shaft being back geared to a large spur gear, which sets directly under the table. On the shaft with this spur gear is a beveled pinion which meshes with the vertical spindle of the drum. Starting is effected by throwing in the clutch with the shipper handle shown in the extreme left of the machine.

The handle on the right is used for throwing the internal clutch and putting the draw-out drum in motion. The wire starting attachment shown in Fig. 2 then starts pulling wire through the die. When it revolves as far as the back of the machine, the hand lever on the starting tongs is struck by a knock-out, which automatically opens the tongs, throwing the main drawing drum into operation. The wire is clamped in the jaws on the top of the main drum, and the machine draws it continuously through the dies, which are supported in the knee shown in the table of the machine. Yokes prevent the wire from going off the top of the drum.

In the machine illustrated, the diameter of the drum is 22 inches and its height is 8½ inches. The linear speed of the drum is 50 feet per minute. Other dimensions are as follows: Linear speed of drawing-out drum, 19 feet per minute; diameter of clutch pulley, 24 inches; face of clutch pulley, 8 inches; speed of clutch pulley, 92 revolutions per minute; height of machine, 5 feet; width, 4 feet 6 inches; length, including clutch, 7 feet 6 inches; weight, 4,000 pounds.

The machine is of heavy construction. At the front and back sheet metal panels, which can be removed easily for making repairs, are fitted. The machines are designed and built by the Standard Machinery Co., Providence, R. I.

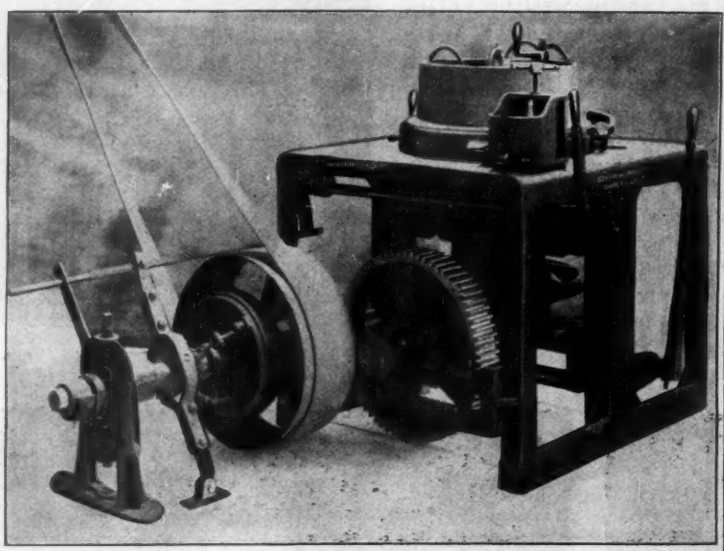


FIG. 1—GENERAL VIEW OF WIRE DRAWING MACHINE

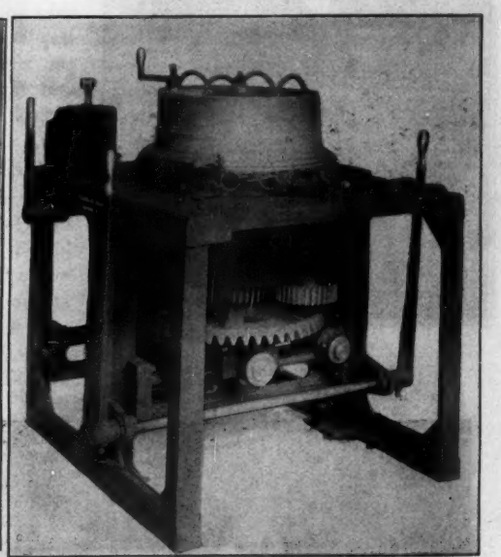


FIG. 2—WIRE DRAWING MACHINE, SHOWING GEAR DRIVE

Electrolytic Iron

Trygve D. Yensen, of the electrical engineering department of the University of Illinois, has, for the past two years, been making a special study of electrolytic irons with reference to their magnetic qualities. The aim has been to secure an iron of high permeability and small hysteresis loss and an iron four times more efficient than any now in use is said to have been secured. A vacuum furnace was used for melting the iron, the pressure in the furnace being reduced to about one-half centimeter of mercury. Pure iron, when melted in the open air, will absorb a quantity of carbon and oxygen and so be of inferior quality, while iron melted in a vacuum does not absorb any of these elements, but remains pure. Various methods were used in cooling, tests being made to determine the effect of cooling slowly, plunging in brine, in liquid air, etc., each iron being tested to determine the magnetic qualities, metallurgical composition, chemical composition, strength and critical temperature. Much valuable information has been gained by these experiments, the results of which are soon to be published in the form of a bulletin by the Engineering Experiment Station of the University.

Construction Costs

For the establishment and conduct of a proper cost accounting system on construction work, a common sense view of the problem to be tackled and patient persistence in working out the details seem to be the chief requisites. It is easy to pay large fees to experts for installing your system. It is not so easy to plug away week after week, working out the system patiently, instructing men, detecting and correcting errors, overcoming opposition and getting results.

A paper by Leslie H. Allen, of the Aberthaw Construction Co., Boston, read before the Boston Society of Civil Engineers, March 25, 1914, is believed to be one of the first which has been presented on the principles and methods of cost accounting on construction work. It has been prepared with the idea of showing just how this procedure can be made to conserve the interests of both contractor and owner, particularly under the rapidly increasing use of the cost-plus-profit form of contract. It is at once flexible and accurate, and should make toward the best interests of all concerned.

Charles Ross & Son Co., 148-156 Classon avenue, Brooklyn, N. Y., has issued a new catalog describing its line of white lead, heavy paste and color mixers.

Chesapeake & Ohio Coal Pier

New Type of Equipment Erected at Newport News, Va., Provided With Electric Elevators With Lifting Capacity of 370,000 Pounds

BY EDWARD J KNAPP

A NEW coal-handling and car-dumping plant of unusual size and capacity is now being completed at Newport News, Va., for the Chesapeake & Ohio railroad. It is provided with a double car dumper, each side dumping cars containing from 30 to 70 tons of coal, at the rate of one every two minutes. Sixty cars per hour can be handled. If the cars were all loaded to the 70-ton limit, the plant could handle 18,000,000 tons of coal per year; actually it is expected that over 9,000,000 tons will be handled annually. The Newport News plant is similar in many respects to the one recently completed for the Norfolk & Western railway, at Lamberts Point, Va.

The Chesapeake & Ohio plant consists of what may be called four units, a twin car dumper, 10 transfer cars, a double elevator, and storage pockets out on the pier. The first three units, with the exception of the structural work in the elevator, were designed and erected by the Wellman-Seaver-Morgan Co., Cleveland, O.

Heretofore the dumping of one car at a time was all that was deemed practical, or at least necessary, but in order to handle the required volume of coal and cut down the lay-over time of ships, it was necessary to make a car dumper that would handle two cars at a time. The object is accomplished in the twin dumper, which handles two cars every two minutes, the time being taken from the time one car is pushed onto the platen until it is run off and the following one takes its position. The car dumper is 54 feet high, 54 feet wide and 103 feet 3 inches long, the dimensions being taken from center to center of the columns. Each side of the cradle has a lifting capacity of 275,000 pounds. It is built to take care of cars up to 100 tons capacity and 53 feet long. Each cradle hoist is operated by two 125-horsepower, 475 revolutions per minute, Westinghouse motors, and each mule hoist by two 175-horsepower, 450 revolutions per minute motors. From both cradles the cars are dumped toward the center of the machine, two operators being required, one for each side.

In operation, the car of coal is pushed over the mule pit where the mule catches it and brings it up a 12.06 per cent grade onto the platen, a movable platform on the cradle. The moment the car is on the platen, the cradle starts up, which movement releases the platen, allowing it to move toward the center of the dumper until the side of the car rests against the protecting block on the upright part of the cradle. While the car is moving up and over, describing an arc of 155 degrees, the car clamps gradually tighten on the car, holding it firmly in position. The clamps are operated entirely by counter-weights. The maximum tip of the cradle, 155 degrees, is enough to allow all the coal to run out of the car. The car is then brought back to rest and is bumped off by the next loaded car onto a 2 per cent down grade. The latter gives it enough momentum to run up the kickback, which sends it out on the track provided for empty cars. The cycle is completed in two minutes.

For receiving the coal, 10 transfer cars, 15 feet high, 12 feet wide and 53 feet 6 inches long, are provided. These cars have a capacity of 115 tons or from two to three of the ordinary service cars and require from four to six minutes to load. Each car weighs about 130,000 pounds when empty. They are equipped with air brakes, standard draw bars, lighting system, drop bottoms, and have six-wheel trucks of standard gage. Each truck is directly geared to a 60 horsepower railway motor operating on 550-volt direct current at 450 revolutions per minute. Care was taken in the design of the cars to insure the coal running out freely when the four bottom gates were opened. The gate mechanism is so arranged that the gates may be pulled up tight allowing no chance for leakage or the strewing of coal along the way.

FIG. 1—PANORAMA OF NEW CHESAPEAKE AND OHIO COAL HANDLING PLANT AT NEWPORT NEWS, VA.

The transfer cars receive the coal from the dumper and are then raised to the pockets which are at an elevation of 75 feet. For accomplishing this, two lifts or elevators, both in the same frame, are provided. Each one has a capacity of 375,000 pounds. Lifting power is furnished by two 450 horsepower, 415 revolutions per minute motors for each elevator. In making the ascent, the swaying motion is stopped with vertical rails on the elevator frame and track wheels at the ends and sides of the platforms.

On the top of the pockets, which extend 1,200 feet out on the pier, rails

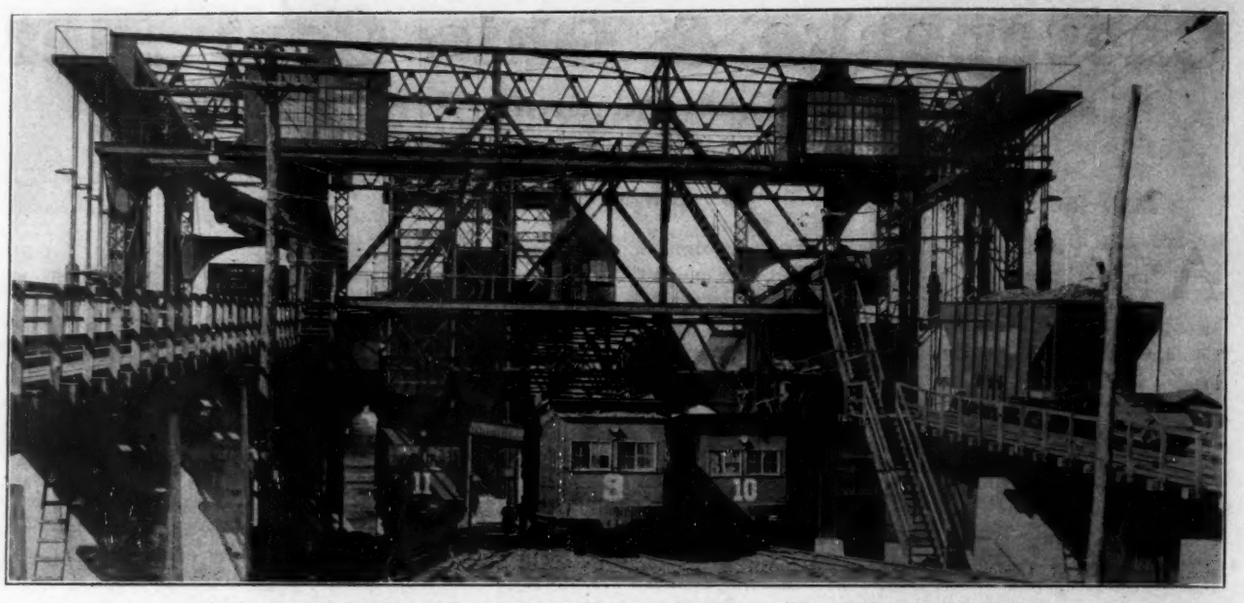


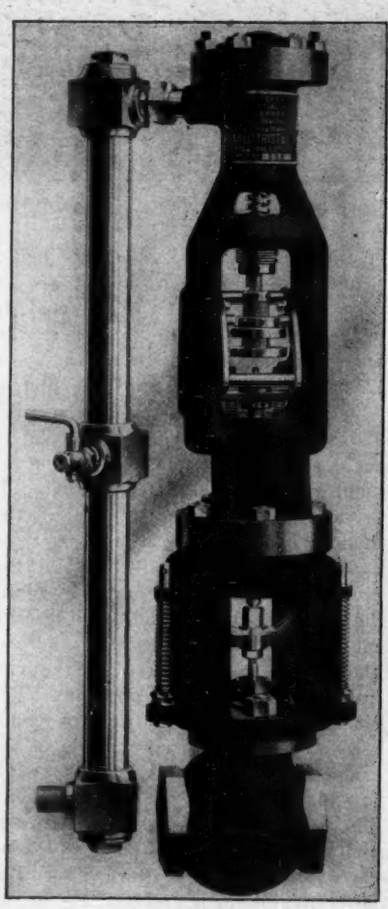
FIG. 2—CAR DUMPER WITH 110-TON TRANSFER CARS IN POSITION FOR LOADING

are provided, on which the transfer cars run, dumping into conical pockets of 120 tons capacity. There are 30 of these pockets on each side of the pier, each provided with an adjustable chute for guiding the coal into the boats. There is room enough for two boats on each side of the pier. The empty transfer cars travel back to the low level by a long 6¼ per cent grade extending from the end of the pier to a point beneath the elevator. The transfer cars travel in a continuous loop.

Use of Producer Gas

The application of cold, cleaned producer gas to high temperature regenerative furnaces is discussed in an 86-page booklet issued by the Smith Gas Power Co., Lexington, O. The material has been prepared by H. F. Smith, secretary and general manager of this company, and points out the various advantages accruing from the use of the Smith system of generating a distributing producer gas. The data contained in this booklet will prove of value to all users of producer gas and to those also contemplating the installation of such generating units.

A Wisconsin machine tool builder erected a new plant in which it was desired to have all electric wiring and piping exposed, both for convenience in repairing and to lower the fire risk. Some difficulty was met in obtaining suitable fixtures to carry the electric light wires on the steel floor beams. Finally special small cast iron insulator supports were designed. They were made in lots of 100 in the firm's own foundry and consist simply of a small yoke which fits the flange of the I-beam, and is clamped by a set screw. In case the wiring is changed these insulator supports may be readily shifted simply by loosening the set screw. The buildings were constructed of concrete and steel with exposed beams.



TRIST PUMP GOVERNOR

New Pump Governor

A new type of pump governor has recently been placed on the market by Ronald Trist & Co., Ltd., 4 Lloyds avenue, London. The governor is so arranged that it will start and stop a steam pump automatically between pre-determined pressure limits. The device consists of a closed cylinder fitted with a piston and piston rod. An extension to the piston rod receives the main water pressure from the feed line on its upper side, while its lower side is fitted over a spiral steel spring. As shown in the accompanying illustration a downward movement of the piston depresses a spindle to which is fitted a double-beat steam valve. The latter allows the steam to enter a small cylinder which is fitted with a piston that actuates a double-beat throttle valve placed in the main steam supply line of the pump. The spindle to which the control valve is attached is provided with a central poppet piece that works in conjunction with a spring. The object of this is to prevent injury to the valve mechanism from any violent blow which might be given by the upper piston through erratic movements of the pump. Such a blow is absorbed by two projections cast on the frame.

The Stow Manufacturing Co., Binghamton, N. Y., has issued a circular describing a two-spindle drill which has a capacity for drills up to ½ inch in diameter, operating at a speed of 450 revolutions per minute. The larger size of this tool will take drills up to ¾-inch inclusive, and operates at a speed of 225 revolutions per minute.

Massive

Is New Home of the Iron and Steel Institute in London

The Iron and Steel Institute held its spring meeting on Thursday and Friday, May 7 and 8, in the house of the Institute of Civil Engineers, St. George street, Westminster, London. The growth in business importance of the West End and the necessary demands of government departments compelled the demolition of the historic home of the institute, but a large and in every way more handsome building has taken its place on the other side of the street at the entrance to St. James' Park.

The massive white stone structure, with its stylish coat of arms, symbolical of engineering, and its eight stone pillars facing the street, give it a very imposing appearance. The new suite of rooms provide ample library and reception accommodation, and the meeting room lined with oak and surmounted by a handsome dome is more spacious than its predecessor, although the square style of the old room with rising tiers of seats, and crimson upholstering, has been generally followed.

The attendance numbered about 350. The international note struck by the election of Adolphe Greiner to the presidency appealed to the meeting, and this note was emphasized again and again.

The first session proved of exceptional interest owing to the excellent discussion on the Talbot process, to which Mr. Talbot himself contributed.

Dr. Arthur Cooper presided at the preliminary proceedings. The report of the council, read by the secretary, J. C. Lloyd, stated that during last year His Majesty Albert, king of the Belgians, had accepted election as an honorary member. Among numerous congratulations to members was one to Prof. W. A. Bone on his receiving the Howard N. Potts gold medal of the Franklin Institute, Philadelphia. Among the deaths recorded was that of F. H. Daniels, Worcester, Mass., John Fritz, Bethlehem, U. S. A., honorary member, and Hon. Vice President Henry Grey, East Orange, U. S. A., and G. W. Maynard, New York. It was pointed out that Mr. Fritz had for many years been an honorary member of the institute, was an honorary vice president, and was awarded the Bessemer medal in 1893.

The financial position of the institute continues satisfactory, the total receipts for the year being £6,591 19s 7d, and the expenditure £6,273 6s 5d, the excess of income over expenditure being £318 13s 2d. Illtyd Williams had been elected a vice president to fill the vacancy resulting from the resignation of A. T. Tannett-Walker, and W. Peter Rylands was appointed to fill the vacancy thus arising on the council. The total membership at the end of last year was 2,102, comprising one patron, seven honorary members, 64 life members and 2,030 ordinary members.

Dr. Cooper, the retiring president, installed Dr. Adolphe Greiner as his successor, remarking that his name was known all through the iron and steel making world.

The newly installed president commenced his duties with the presentation of the Bessemer medal for 1914 to Edward Riley. That gentleman, owing to age and infirmity, was unable to be present, but the medal was received on his behalf by his partner, F. W. Harbord, of London.

The president described Mr. Riley as an old and honored member of the institute. He was connected with the two most important advances in the manufacture of steel. In 1853 he carried out the first experiment with the Bessemer process at Dowlais, and made the first blow of steel in a converter built like a chimney. A piece of this was still in the possession of the Iron and Steel Institute.

Marked Decline in Earnings

The annual statement of the Dominion Steel Corporation for the financial year ending March 31, as was anticipated, showed a marked decline in earnings from a year ago, and justified the action of the directors in passing the dividend on common stock. The net earnings, after deducting provision for sinking funds, depreciation and interest, etc., were $1,854,825, as compared with $2,372,667 for the previous year, being slightly under 2¼ per cent on the common stock. The balance on hand was $796,907 as compared with $883,012. Had the full dividend on common stock been paid, the impairment for the year would have been $406,415. This showing is due to the falling off in business during the last quarter of the financial year. Earnings for the first three months were well over 6 per cent, which shrank to 5.6 per cent at the end of the third quarter. President J. H. Plummer states that he believes business conditions will soon right themselves and looks for a recovery within the next half year.

Low Prices

On Steel Products Made by Foreigners on Pacific Coast

Seattle, Wash., May 16.—Careful inquiry regarding comparative prices on the output of foreign and American mills laid down in this section develops the fact that no two foreign mills are agreed upon a price to be charged. The following may be considered a fair statement as to prices at this time.

A large consumer of pig iron states that the best foreign quotation he has been able to obtain is $24 for foreign pig, while $22 is asked for the American output. But this price for American pig is lower than it has been for several years. On small angles and muck bar iron the price is about a standoff, the price being something like 2½ cents per pound, or $45 to $50 a ton. Sheets are also approximately a standoff, sales for No. 16 gage black being at $2.55 per hundred, or $56 a ton. One prominent dealer states that prices on bars laid down here are $1.35 per hundred on foreign goods and $1.90 by rail for domestic or American goods, the lake and rail price being $1.85. The American goods can be laid down here by water at $1.65 as compared to $1.35 for foreign. A few of the Seattle merchants have taken flyers in the matter and something like a thousand tons have been shipped in since the tariff went into effect.

Another prominent steel man says that structural steel, including beams, angles and channels, can be laid down here by the foreign mills at $34 as against $39 by the American mills. The American price on reinforcing bars is $1.85 per hundred, or $39 per ton, as against $34 to $35 per ton on foreign goods of this nature. On American bars the price is $38 laid down here, while the foreign article of this nature can be bought as low as $32. Plain steel bars can be had at $29 a ton while the best that can be done on the American make is $38. It is estimated that since the tariff law went into effect, something like 5,000 to 6,000 tons of foreign structural steel have been shipped to San Francisco, Portland and Seattle. Prices of Pacific coast mills are a trifle under those of American eastern mills. As indicated above, there is great diversity of prices among foreign mills, and these prices fluctuate so that as a matter of fact the whole situation is pretty much up in the air.

The North & Judd Mfg. Co., New Britain, Conn., is to build a one-story brick addition, 11 x 74 feet.

When the Clock Was Put Ahead

(*Continued from page* 907)

and we think will remain so during the winter as well as the summer. In our estimation, there is no question about the change being a wise one.

* * *

The H. Black Co.

By N. C. Edwards

Our clocks prior to May 1 were from 7:00 to 5:00 o'clock, with an hour for lunch. On May 1 we changed from central to eastern time. As far as we can ascertain, the change is popular with our employes. Going through the factory taking a "hit and miss", just as I met the people, I found 105 in favor against 7 unfavorable. We have not noticed any tardiness or confusion through this change. The writer thinks that the change in winter will not be as popular as in summer, but after the few months of winter pass, the objection will melt out of sight. On the whole we consider the change a wise one inasmuch as it gives the working man and woman an opportunity to have a little more daylight for themselves. The people, however, tell me that it is not the going to bed an hour earlier but the waking an hour earlier in the morning than they have been accustomed to for months and years past that seems to be the hardest adjustable point. However, the writer has overcome the difficulty with an alarm clock.

Regarding the time of change, beg to state the night before all our clocks were moved one hour ahead at quitting time and as people came down to ring up their time they were greeted with this notice: "These clocks are changed to eastern time. Change your watches. Be on time in the morning." The writer personally feels that it is difficult to state what this change will be for our people during the winter months. I am sure that at the beginning of winter there will be some complaint, as there always is with every change.

* * *

The Warner & Swasey Co.

By F. A. Scott, Secretary and Treasurer

The hours of our shop employes prior to May 1 were from 6:30 to 11:30 and 12:00 to 5:00 central time, on week days, except Saturdays, on which they were from 6:30 to 11:30, central time. At 4:00 o'clock on April 30 we advanced our clocks one hour and closed the shop, and on May 1 we began at the same time as formerly, 6:30 o'clock, but according to the clock as changed. We have observed no change in conditions, nor have we heard any criticisms or other comments by our employes in respect to this change. There has been no tardiness or confusion of any kind resulting therefrom, and indeed we do not ourselves see that it is any different from what might have occurred if during the night of April 30, without our knowledge, all clocks had been pushed forward one hour.

* * *

The Upson Nut Co.

By Willard Fuller, General Superintendent

Prior to May 1, we ran our different departments on various times, beginning at the earliest with 5:00 o'clock standard to 6:30 standard. On May 1, our turn men started at 6:00 a. m. eastern time and others at 7:00 a. m. eastern time. We have not noticed any particular results, except that we have had no complaints, and, so far as we know, the hours are satisfactory.

In regard to the eastern standard time being popular in the winter as in the summer, the writer believes that it will not be, although we may all get so used to the present time that we will not notice it. We think that the change in time was wise and will prove to be satisfactory.

* * *

The Cuyahoga Telephone Co.

By C. Y. McVey, Vice President and General Manager

We operate twenty-four hours a day; employes average approximately eight hours. Prior to May 1 our schedule was built on central standard time; since May 1 we have changed to eastern standard time. We believe the results have been good and that eastern time is popular with the employes. We have not experienced confusion of any kind and know of no reason why eastern standard time will not be as popular in winter as it is in summer. On the whole, we believe the change a wise one.

* * *

The American Multigraph Co.

By R. G. A. Phillips, Secretary

Prior to May 1 our factory was operating on central time, the hours being 6:30 to 11:30; half hour for lunch; 12:00 to 5:00, making in all ten hours per day for five days a week. On Saturday we operated from 6:30 to 11:30, closing down Saturday afternoon the year round. On May 1 the clock was moved forward one hour, but we started at the same time by the clock as in the past, so according to the clock we have not changed our hours of labor from what they were before we changed to eastern time. While it is difficult to state with exact authority, my opinion is this change of time has been generally popular with the employes. At the starting time on May 1 there was a slight amount of tardiness and confusion, and the first day 23 men were late coming to work in the morning. The next day, however, conditions were normal and they have been ever since.

Relative to the popularity of eastern time in winter as compared with summer, it is possible it may not be quite as popular then as now, but in so far as the factory is concerned we must remember there is quite a time during the winter, under the old time, when it was necessary for the men to get up and come to work in the dark; so we do not believe there will be a very great amount of complaint the coming winter. Altogether, we believe it has been a step in the right direction to make this change, because one thing which has been sadly needed in this country is greater opportunity for outdoor exercise and recreation, not only for the factory worker, but for all who have inside positions, and this additional hour is going to get people more in the habit of outdoor life, which will eventually benefit everyone.

* * *

The Wm. Edwards Co.

By H. R. Edwards

Prior to May 1 our factory and shipping force reported at 6:30 central standard. Our office force reported at 7:00 central standard. On May 1 we adopted eastern time and kept the same hours. We have not noticed any particular results. We have heard nothing from our employes as to whether they are pleased or displeased. In other words, the change has been adopted and the old time has been forgotten. There has been no tardiness or confusion of any kind. We have no reason to think that there will be any dissatisfaction with the change this coming winter. We think by that time that everything will have adjusted itself and central standard time will have been forgotten. We are not prepared to state

that we consider the change a wise one or an unwise one. As we look at it, the daylight you gain in the evening you lose in the morning.

* * *

The Cleveland Telephone Co.

By Allard Smith, General Manager

As relating to the effect of the adoption of eastern time, you may be interested in the attached communication which I sent to Mayor Baker following our decision to make the change. We have not found that this change has resulted in any unusual tardiness or confusion, and, while it has not been in effect very long, what indications have developed are in its favor. I believe the change is popular amongst the employes. It is our feeling that by the time winter arrives we will be so accustomed to the present arrangement that the difference will not be noticed, and, on the whole, we believe the change to have been a wise one.

(COPY)

April 17, 1914.

Hon. Newton D. Baker,
Mayor City of Cleveland,
Cleveland, O.

Dear Sir:—

In connection with the consideration and discussion upon the matter of changing from central to eastern time on May 1, the Cleveland Telephone Co. desires to state that it will adopt eastern time throughout its entire organization and service, in accordance with the wish of the city as expressed in the ordinance.

You may be interested to know that between the hours of 6:00 and 7:00 o'clock in the morning 45 per cent of all originating telephone calls in the entire Cleveland exchange are inquiries from our subscribers for the time of day, while at a number of the larger exchanges located in the residential districts the originating calls for "time" at this hour in the morning run as high as 84 per cent; approximately one-third of the operators on duty at this period are required for this purpose.

We anticipate that the public and our subscribers will change their habits as regards time gradually so that there will be an interval—how long we do not know—before all become adjusted to the new time schedule, during which there may be some small confusion. Probably our operating day will be lengthened during this period of adjustment, both in the morning and in the evening.

Responding to these requests for "time" after May 1, the operator will use the term "eastern" as a suffix to stating the hour and minute position of the clock. While we anticipate that the 18,000 requests for "time" each day will be materially increased, especially during this adjustment period, we are preparing to meet this increase in traffic, and will make every effort to handle this information in a way entirely satisfactory to our subscribers and the public. Yours truly,

(Signed) Allard Smith, General Manager.

* * *

The Printz-Biederman Co.

We have never known a change so extremely radical as that of the change from central standard to eastern time to be attended by so little confusion or friction as was this change recently brought about here. Our hours of work are the same as they were under the old time, there has been no default or tardiness on part of our employes, and the change has evidently met with nothing but a pleasant reception. We might say that in our own case our employes were given an opportunity some time prior to the change to express their preference, and their sentiment was overwhelmingly in favor of the change. That they were sincere in this is fully borne out by the events. What the effect of it might be in winter, we cannot now say, but should there be any hardship or difficulty regarding it, we could quite readily arrange for a winter schedule as differentiated from a summer schedule.

* * *

The National-Acme Mfg. Co.

By W. R. Mitchell, Superintendent Product Department

We beg to answer your questions as follows:

1. 6:30 a. m. to 11:30 a. m.; 12:00 noon to 5:00 p. m. central time.
2. The same starting and quitting time as in the past, only on the new eastern time basis.
3. No difference noticed except that employes enjoy more daylight after the day's work is done.
4. We have not heard much comment one way or the other.
5. Change has not resulted in confusion or tardiness.
6. We know of no good reason why it should not.
7. We are heartily in accord with the new change in time, now more so than ever.

* * *

The Acme Machinery Co.

By D. R. Davies, Secretary and Treasurer

We are pleased to advise that we have fallen in line and adopted the eastern standard time. We will therefore answer your questions in the same rotation as you ask them.

1. What were the hours of your employes prior to May 1? 6:30 a. m. to 5:00 p. m. central time.
2. What hours did you adopt on May 1? 6:30 a. m. to 5:00 p. m. eastern time.
3. What results have you noted? We have not noticed any particular results.
4. Is the change popular with the employes? Yes.
5. Has it resulted in much tardiness or confusion? No.
6. Do you think eastern standard time will be as popular in winter as in summer? Question.
7. On the whole, do you believe the change has been shown to be a wise one? Yes.

* * *

The Kirk-Latty Mfg. Co.

We will answer your questions in the order asked as follows:

1. Hours prior to May 1 were 6:30 a. m. to 5:00 p. m. central standard time.
2. Hours adopted May 1 were 6:30 a. m. to 5:00 p. m. eastern standard time.
3. Have noticed no results.
4. Change is popular with employes.
5. It has not resulted in tardiness or confusion of any kind.
6. Yes, we think eastern standard time will be as popular in winter as in summer.
7. Yes, we believe the change is a wise one.

* * *

The Winton Motor Car Co.

By W. J. Ward, Advertising Department

Following are our replies in the order in which you ask the questions:

1. 6:30 to 11:30, 12:00 to 4:00 central. 2. Same hours,

eastern time. 3. Generally satisfactory. 4. Yes. 5. No. 6. Yes. 7. Yes.

Cleveland Worsted Mills Co.

By L. H. Nash

1. 7:15 a. m. to 12 m. and 1 p. m. to 6. p. m., sun time.
2. 6:45 a. m. to 11:30 a. m. and 12:30 p. m. to 5:30 p. m., eastern standard.
3. None.
4. Yes, generally.
5. No.
6. See no reason why it should not be.
7. Exceedingly so.

* * *

The White Co.

By Windsor T. White, President

Our factory hours prior to May 1 were 7:00 to 11:30 a. m., 12:00 to 4:30 p. m. We made no change in this when we changed to the eastern standard time. Employes at the present time are apparently well satisfied with same. The change was made without tardiness or confusion. We cannot yet tell how this will work out in the winter time, but I am rather of the opinion that we shall have to change our hours for at least the four dark months of the year.

* * *

White Sewing Machine Co.

By Wm. Wayne Chase

Your inquiry of the 11th received. We answer your inquiries categorically. Prior to May 1 our factory hours were 6:50 a. m. until 4:20 p. m.; office hours, from 7:30 a. m. to 4:00 p. m., central time. Since May 1 we have made no change except to use eastern time. We think that the change during the summer months will prove popular with our employes. During the winter months we anticipate making both factory and office hours one hour later, although this has not been definitely decided. We do not think that there has been any tardiness or confusion occasioned by the change from central to eastern time, although our opinion is that in the winter season eastern time will not be popular. We were perfectly satisfied in the conduct of our business under the old or central time, but may find that the change to eastern time will result in its cordial endorsement by our factory and office people, especially during the summer months. Trusting that our answer is along the line that you desire, we are, etc.

* * *

The Bailey Company

By Victor W. Sincere

Our hours previous to May 1 were 8:00 a. m. to 5:30 p. m., excepting on Saturdays, which were from 8:00 a. m. to 6:00 p. m., and our hours remain the same after the change to eastern time. The change is very popular with our employes, and it has not resulted in tardiness or confusion of any kind. It is impossible for us to state whether or not the eastern time will be popular in the winter, but we believe the change is a wise one, and adds to the enjoyment of our employes in their home life.

* * *

The May Co.

By M. L. Dauby, General Manager

We adopted eastern time after taking a vote of our people and practically all of them were in favor of it. As far as the time is concerned, it works out very satisfactorily, for after the change is made no one knows the difference beyond the fact that he has more daylight in the evening.

You ask whether we think people will like it as well in winter as in summer. I do not believe they will, for it may be dark at the time they have to go to business, but that only covers a few months in the year as against nine months of increased daylight.

Prior to May 1 our employes started to work at 8 a. m. and stopped at 5:30 p. m. The same time continues, only we start and stop at 8 a. m. and 5:30 p. m. eastern time. The change is very popular with the employes and has not resulted in an extra amount of tardiness or confusion. Taking it as a whole, we think the change is a very good one, and we do not regret having made it.

Dock Balance Grows

The amount of ore on Lake Erie docks May 1 was 5,920,157 tons, compared with 5,909,829 tons in 1913, an increase of 10,328 tons. Total rail shipments to furnaces from Lake Erie ports during the winter season were 3,341,519 tons, against 3,790,691 tons for the preceding year. The entire movement of ore to furnaces over Lake Erie docks during the year ended May 1, 1914, was 39,089,319 tons. This compares as follows with years ending May 1:

Year.	Tons.
1914	39,089,319
1913	37,640,621
1912	26,428,799
1911	32,542,654
1910	33,764,842
1909	20,637,084
1908	31,845,603
1907	31,983,546
1906	29,446,561
1905	20,195,286
1904	18,739,995
1903	21,905,251
1902	17,216,065
1901	14,468,260
1900	15,882,881

The following table gives the amount of ore on dock at the close of navigation last year and the opening this year:

Port.	May 1, 1914.	Dec. 1, 1913.
Buffalo	271,492	319,726
Erie	461,750	594,613
Conneaut	495,153	1,248,032
Ashtabula	2,187,622	3,202,807
Fairport	245,038	478,014
Cleveland	1,487,292	1,930,720
Lorain	245,057	694,704
Huron	308,478	441,541
Sandusky	2,741	2,472
Toledo	215,534	349,047
	5,920,157	9,261,676

Out of a total movement of 269,686 gross tons of ore during April, 50,544 tons went to Lake Erie ports, distributed as follows:

Port.	Gross tons.
Buffalo	38,710
Cleveland	11,834
Total	50,544

War Map.—Branch offices of Rogers, Brown & Co., Buffalo, are sending out special war maps of Mexico, showing portions of the country occupied by the constitutionalists, the federals and the United States navy. Attached to the map is a list showing names of Mexican officers and cities and a key to the pronunciation of these names is offered.

Takes Over Foundry

The Pirkl Foundry Corporation, Long Island City, N. Y., which recently was incorporated with a capital stock of $25,000, has taken over the foundry portion of the business of the John Pirkl Iron Works. William Begen has been made president of the new corporation, D. Leonard Schnepf treasurer and Hyman Yendelman secretary. Mr. Schnepf is a son-in-law of Mr. Pirkl and was the secretary and treasurer of the former company.

The Beaton & Caldwell Co., New Britain, Conn., has increased its capital to $100,000.

TIPS FOR NEW BUSINESS

Equipment needs of the Iron and Steel works, Machine shops, Foundries and other Metal Working plants

In Pittsburgh, there is no material change in the market for machine tools and heavy rolling mill equipment. Dealers continue to complain about the lack of snap to buying. Inquiries are coming out in fairly satisfactory volume, but buyers show a decided tendency to postpone definite action as long as possible.

In New York, while the actual volume of business booked does not show much change, there prevails a better feeling among machinery sellers and manufacturers. This is due largely to somewhat improved inquiry and a more hopeful spirit among buyers of machinery. It is felt generally that conditions are ripe for the development of a buying movement. Among the most important factors which tend toward doing away with the more or less pessimistic feeling which prevailed till recently is the approach of the time when the Interstate Commerce Commission is expected to announce its decision with respect to the application of eastern railroads for a 5 per cent increase in freight rates. This decision is expected to be handed down well within 30 days. Whether the decision is favorable or unfavorable to the railroads, it is believed that its announcement will be followed by the release of many orders by the railroads. It is known that these interests are in need of much new equipment and that it will not be possible for them to follow their non-buying policy much longer. One of the largest inquiries of the week was from Von Thaden & Meyer, New York City, who are in the market for from 500 to 1,000 grinders of assorted sizes. These grinders are to be accompanied by corundum wheels ranging 4, 5 and 6 inches in diameter. This inquiry was not accompanied by definite specifications. The second-hand machinery market is fairly active. Inquiry for cranes is improved.

In Chicago the machine tool trade has failed to receive any impetus in new orders and dealers are far from busy. Some buying of single tools continues. Some interest is being shown in the effort of the Pere Marquette railroad to float receiver's certificates and, if this is done, it is believed a considerable number of machine tools will be bought.

In Cincinnati, the railroad rate question is prominent in the minds of manufacturers at the present time, and is receiving more discussion than anything else. It is frequently stated that business cannot be expected to improve until this matter has been settled, as conditions will be uncertain as long as it is pending. Machine tool business during the past week has been very quiet and unsatisfactory. Business booked during the first half of May was below either the first half or last half of April. Second-hand machinery is very slow, but is a little better than new machinery. Small electrical equipment is fair, but shows no improvement. Special machinery is slow, makers are busy on old orders.

EASTERN STATES

BANGOR, ME.—The Bangor Railway & Electric Co. will spend $191,000 this year for improvements in lighting, power and car lines; of this $43,000 will be used for reconstruction work in Bangor, $28,500 for new water wheels at Veazie power station and $37,000 for extending the lines of the Bar Harbor & Union River Power Co., a subsidiary concern in Hancock. Light and power lines will be extended 20 miles from Ellsworth to Bluehill.

FITCHBURG, MASS.—A. D. Waymouth & Co., lathe manufacturer, plans to build a modern machine shop to replace the old one now in use.

MALDEN, MASS.—The proposed industrial building to be erected here is being arranged for by an organization with $100,000 capital; the first unit will be 200 feet long, of modern mill construction, estimated cost, $43,000.

ALBANY, N. Y.—The Modern Railway Appliance Co. has been incorporated to establish a general machine shop and foundry here for the manufacture of railway appliances; $20,000; Walter V. Simmons, Charles A. Simmons, 245 North Pearl street, Albany, and John J. Canavan of Brooklyn, are directors.

AVON, N. Y.—The Enameled Steel Package Corporation has been incorporated; $700,000; by J. A. Cawles, J. H. Charity, H. R. Allen, Rochester,

BROOKLYN. — The Terminal Ornamental Iron Works has been incorporated; $16,000; by Elizabeth V. Petersen, Peter Petersen and Peter Peterson, of Brooklyn.

LYONS, N. Y.—The Lyons Cold Storage Co. has been incorporated; $50,000; by Chas. Barick, Chas. Coffey, W. S. Gavitt.

NEW YORK CITY.—H. Maimim Co. has incorporated; cloth-cutting machinery; $50,000; by M. I. Garsheilis, D. S., and Hyman Maimim, 97 Ft. Washington Avenue.

ALLIQUIPPA, PA. — Kidd Drawn Steel Co. has been incorporated; $50,000; by W. S. Kidd, Beaver; H. W. Sutton and E. W. Sutton, Crafton.

ERIE, PA.—This city is asking bids on constructing high current electric conduits of reinforced concrete and steel for all lighting and power lines running in State street, covering 14 blocks of the business section. A $50,000 appropriation has been made.

PITTSBURGH.—Fromite Laboratories Co. has been incorporated; $7,500; by George S. Hulings, Oil City; H. E. Heilman, Kittaning; W. P. Fisk and R. P. Marshall, Pittsburgh.

PITTSBURGH.—The Westinghouse Electric & Mfg. Co., Pittsburgh, has received contracts for four 15,300 kilowatt turbo-generator sets for installation in the Brunots Island power station of the Duquenne Light Co., Pittsburgh. The power plant will be further increased in capacity by the purchase of 20 additional boilers.

POTTSTOWN, PA. — Pennsylvania Products Co. has been incorporated; iron and steel; $5,000; by James A. Bailey, J. Albert Whitacre, Pino Forge; Albert L. Trego, Pottstown; and Howard Y. Spare, Royersford.

READING, PA.—David S. Keiser, of the Reading Shear Works has bought a site for a factory between Reading and Pennsylvania avenues.

EAST TRENTON, N. J.—The McFarland Foundry & Machine Co. will erect a large addition to its plant here.

NEWARK, N. J.—The Oxwald Acetylene Co. will erect a 3-story, $50,000 addition to its plant at 640 Frelinghuysen avenue.

NEWARK N. J.—The Aluminum Goods Mfg. Co. has bought a block of 270x575 feet. The company has plans under way for a one story addition to its present plant at Springfield and South 19th streets, to be used as a foundry.

NEW BRUNSWICK, N. J.—The Braun Wrought Iron Castings Co., of Bayonne, has leased the plant of the Middlesex Bridge Co. and will locate here.

TRENTON, N. J.—The city will build a $40,000 infirmary soon on the site of the city almshouse.

CENTRAL STATES

AKRON, O. — The Pennsylvania railroad plans to double track its road between here and Hudson. It will purchase additional property for right of way.

BELLEFONTAINE, O. — The Humphrey Pipe & Foundry Co. has purchased the building and grounds of the Bellefontaine Foundry & Machine Co. and will occupy the same soon. The firm will be in the market for a 5 to 10-ton hand power jib crane.

CINCINNATI.—The Fox-Ahrens Fire Engine Co. has bought a frontage of 27 feet adjoining its plant, which will be improved in the form of an addition. The company manufactures fire fighting apparatus.

CINCINNATI.—New bids will be received by the commissioners of the new City Hall, Norwood, a suburb of Cincinnati, for reinforcing material and electrical equipment. Bids were rejected at a recent meeting.

CINCINNATI.—Samuel Hanniford & Sons, architects, of Cincinnati, have been commissioned to prepare the plans for a new medical building for Vanderbilt University, of Nashville, Tenn., to cost about $350,000.

CINCINNATI.—The Cincinnati Mfg. Co., which manufactures ornamental iron, bronze and brass work, has purchased an additional site of 55 x 75-ft adjoining its plant, upon which an addition will be built in the near future.

CINCINNATI. — The Cincinnati Iron & Steel Co. will build an addition to its plant in order to secure more warehouse space. The new portion will be 75 x 75 feet, and will be of brick and concrete construction. The steel will be furnished from the company's shops.

CINCINNATI. — The Irwin-Leighton Co., of Philadelphia, has received the contract for the construction of the new assembling plant of the Ford Motor Co., Cincinnati. The plans call for a fireproof building of concrete construction to cost about $275,000. The contractors will be in the market shortly for several hundred tons of reinforcing bars.

CINCINNATI.—Bids will be opened at Cincinnati on June 11 for the construction of three new steel barges for use in government river improvement work on the Muskingum and Big Sandy rivers. The bids will be received by Col. Henry Jervey, in charge of Cincinnati district No. 2, Corps of Engineers. The cost of each barge will be about $4,000.

CINCINNATI.—Plans are being prepared by Tietig & Lee, architects, of Cincinnati, for an addition to the plant of the Ault & Wiborg Co., in Norwood, a suburb. The new portion will be 90 x 151 feet, and will contain 13,500 feet of floor space. The construction will be of concrete and brick, reinforced with steel. It is estimated that about 100 tons of reinforcing materials will be needed.

CLEVELAND.—Bids will be received until noon May 29 at 513 the City Hall for an electric freight elevator for the city hospital.

CLEVELAND.—The Ohio Soda Tank Mfg. Co. has been incorporated; $5,000; by P. E. Klein, Fred Priesand, Alex. Morrison, D. Shaw and M. J. Scott.

CLEVELAND.—The Acme Fence & Iron Co. has been incorporated; $10,000; by L. C. Heimberger, F. W. Raehl, William Hemmermeister, William A. Dreher, W. J. Zoul.

CLEVELAND.—The Specialty Forging Co. has been incorporated; foundry; $30,000; by James O. Bennett, John Quinn, Ned M. Austin, A. W. Agler and Mary G. Beiter.

CLEVELAND.— The Osborn Engineering Co., Cleveland, has awarded contracts for two additions to be erected by the Firestone Tire & Rubber Co., Akron, O. One building will be 40 x 180 feet, four stories and a basement, and the other will be 100 x 180 feet, four stories and a basement. The general contractor is the Carmichael Construction Co., Akron, and the steel work, about 1,000 tons of shapes and bars, has been awarded to the Berger Iron Co., Akron.

CLEVELAND.—The Elwell-Parker Electric Co. has been incorporated; electrical apparatus; $100,000; by S. Q. Kerruish, G. E. Hartshorn, George W. Spooner, X. I. M. Harrivel.

CLEVELAND. — Architect John Elliott, Rockefeller building, will take bids soon for the Youngstown Hippodrome for which he is preparing plans. It is to be a large structure.

CLEVELAND. — The Coleman Foundry Equipment Co. has been incorporated to manufacture and deal in foundry equipment; $10,000; by F. A. Coleman, Lucie A. Coleman, C. H. Frank, D. S. Hawkins and Albert Farrell.

COLDWATER, OHIO.—The Fox & Hess Co. has been incorporated; grist mill; $50,000; by Henry C. Fox, Charles Hess, Edw. G. Hess, Rosa Fox and Sophia Hess.

COLUMBUS. — The Auto Combination Switch Lock Co. has been incorporated; $10,000; by H. R. Elliot, C. E. Dennis, L. A. Van Anda, L. M. Van Anda, E. B. Dennis and Edw. Dennis.

GALLIPOLIS, O.—Bids will be received until May 23, 10 a. m. by W. E. Haswell, Hartman building, Columbus, for a dormitory to be erected at the Ohio Hospital for epileptics; McCarthy & Bulford, Columbus, architects.

SIDNEY, O.—The Lauterbur Machinery Co. has been incorporated; threshers; $10,000; by F. X. Lauterbur, Paul Lauterbur and K. F. R. Lauterbur.

SPRINGFIELD, O.—W. W. Lindsay, of Philadelphia, who has the contract for the proposed car barns and shops for the Springfield railway, has not let sub-contracts yet. Machinery is already provided.

TOLEDO, O.—Toledo Aluminum Co. has been incorporated; $5,000; by William H. Bell, et al.

TOLEDO, O.—The Rupp-Skeldon Motor Co. has been incorporated to manufacture all kinds of motors; $50,000; by Robert G. Young, James Nye, James Greenwald, Bess Young and B. W. Johnson.

TOLEDO, O.—Permits have been issued for building 122 x 162-foot addition to the Shaw Thoene Co. plant at an estimated cost of $28,000; also for a 26 x 525-foot addition to the Overland factory at a cost of approximately $48,000.

URBANA, O.—The Acme Die & Stamping Co., incorporated in Columbus last week with $10,000; by C. M. Diver, Ralph Burnham et al., is a reorganization of the Urbana Engineering Co. It has leased the Gaumer building and will buy considerable equipment.

WARREN, OHIO.—The General Malleable Co. has increased its capital stock from $25,000 to $50,000.

WELLSTON, O.—The Economy Furnace & Heater Co. has been incorporated; $30,000; by J. H. Sellers, L. C. Vogelsong, E. H. Willis, J. H. Browne and C. E. Fitzpatrick.

LEXINGTON, KY. — Eighty-six rooms will be added to the Phoenix Hotel. Plans are now being prepared for this addition, which will have a frame work of steel, and which will cost about $250,000. The tonnage of structural materials has not been determined.

MT STERLING, KY.—Plans are being prepared by Weber, Werner & Atkins, architects of Cincinnati, for a hotel which will have 85 rooms and cost about $100,000. The owner is H. C. McKee, of Mt. Sterling.

ELKHART, IND.—The Elkhart Mfg. Association plans to build a $50,000 electric power plant on the site of the old mill near the corner of Beardsley avenue and Riverside drive for developing power to furnish electric current for the plants owned by members. The plant as planned will contain three units capable of developing 250-horsepower each.

EVANSVILLE, IND.—The Harmony Piano Co. has been incorporated with a capital stock of $30,000, to take over the plant of the Heller Piano Co., of that city. The new company will continue the manufacture of pianos.

FRANKFORT, IND. — The Clover Leaf railway will install a new brass foundry at the local shops in the near future.

INDIANAPOLIS. — The Southern Indiana Power Co. has been sold to capitalists headed by Chester P. Wilson, of this city; capital stock, $800,000. The power plant is located at Williams on White river.

INDIANAPOLIS. — The Federal Foundry Co. has been incorporated to manufacture and sell iron castings, etc.; $200,000; by J. I. Dissette, Indianapolis; B. W. Duck and E. R. Lewis.

LAFAYETTE, IND.—Lafayette & Northwestern railroad has been incorporated with $100,000 capital stock to operate interurbans; incorporators, O. L. Brown, G. J. Thompson, O. A. Cummins, A. P. Ranier.

MISHAWAKA, IND.—The Amplex Mfg. Co. has been incorporated with a capital stock of $200,000, to manufacture automobiles, Among the incorporators are Harold M. Pulsifer, E. J. Gulick and R. W. Randall.

AURORA, ILL.—Love Bros. Mfg. Co. has purchased the plant and real estate of the Acorn Brass Co. and will either use it to enlarge its present business or rent it for the present. Sale price was $25,000.

CHICAGO.—The American Building Foundry Co. has purchased a lot between Twenty-second street and the Burlington tracks west of Springfield avenue and will start work soon on a 1-story foundry and office building.

CHICAGO.—Roanoke Mfg. Co. has been incorporated to manufacture lamps and machines for printing; $25,000; by James I. Leary, E. A. Farrell and Fred E. Newton, 53 West Jackson Blvd.

CHICAGO.—Electric Moulding Co. has been incorporated to manufacture and sell metal moulds and fittings for electrical devices; $5,000; by I. M. Parker, S. A. Harris and O. N. Stookey, 154 West Randolph street.

CHICAGO.—The Van Dorn Girder Plate Co. has been incorporated to manufacture metalic and other plates for railway and electric car construction; $25,000; by Wm. S. Van Dorn, 2325 South Paulina street, et al.

CHICAGO.—The Diamond Case Hardening Copper Co. has been incorporated to manufacture hardened, mixed and tempered metals; $50,000; by Chester E. Jacobson, Wm. C. McHenry, Warner H. Robinson, 38 South Dearborn street.

CHICAGO.—The Illinois Modern Machine Co. has acquired the land at 2237-45 Ogden avenue as a site for a 4-story factory building to cost about $35,000. It will be used for manufacturing button machines and button parts.

CHICAGO.—The Railway Economy Device Co. has been incorporated to manufacture railway equipment and supplies; $10,000; by A. R. Peffers, Sidney R. Robinson and Fred C. Schultz, Fifth avenue and West Harrison street.

CHICAGO.—The Van Dorn Coupler Co. has been incorporated to manufacture couplers for railway cars and auto trucks, etc.; $10,000; by Wm. S. Van Dorn, 2325 South Paulina street, Emma B. Van Dorn and Herbert E. Van Dorn, et al.

CHICAGO.—The Brass & Copper Products Co. has been incorporated to operate a machine shop, rolling mill, planing mill and foundry; $25,000; by Wm. R. Tribbey, Rae

Ladensohn, 5440 Winthrop avenue, George Hester, 1455 South Michigan avenue.

CHICAGO.—The American Building Foundry Co. has bought a lot between Twenty-second street and the Burlington tracks east of South Fortieth avenue. Excavation has been started for a one-story foundry and office building. The company's plant is now at Rockwell and Nineteenth streets.

LANSING, MICH.—Small Bros. Bridge Co. has been incorporated to build and erect bridges; $8,000.

MUSKEGON, MICH.—The Muskegon Casnovia Land & Development Co. may build a 67-mile interurban line between Muskegon and Stanton. Nearly all rights of way have been secured.

APPLETON, WIS.—The Carson-Rowell Co., producers of babbitt metal, has broken ground for a new plant to cost $25,000 and have an annual capacity of 5,000,000 pounds of metal.

APPLETON, WIS.—The re-organized Killen-Strait Mfg. Co., gas tractors, power farm machinery, etc., formerly the Killen-Walsh Mfg. Co., has been permanently financed by the entry of A. W. Priest, an Appleton capitalist, who has taken the remainder of the stock and becomes secretary and treasurer of the corporation. The capital stock is $200,000, fully paid in. The company has decided to ignore further offers to move elsewhere and will proceed with plans for additions to the present works, formerly owned by the Double Power Windmill Co. A new machine shop and assembling room will be the first new structures.

BARTON, WIS.—The Woodford Engineering Co., manufacturing hoisting and conveying systems for quarries, mines, etc., is building a large frame and sheet steel addition to its assembly shop.

BELOIT, WIS.—E. M. Kenyon, manager of the Chicago branch of the Dodge Mfg. Co., Mishawaka, Ind., who recently purchased the works of the defunct John Thompson & Son Co., at South Beloit, for $30,000, intends to engage in the manufacture of gasoline engines for farm use. Definite plans are not ready for publication.

CLINTONVILLE, WIS.—The South Side Machine & Auto Co., capital stock $15,000, has been organized by William Splittgerber, G. Frank Ebert and Arthur Poetter to conduct a general machine shop and automobile repair shop.

COLFAX, WIS.—The estimates of A. T. Thompson, Chippewa Falls, Wis., consulting engineer for the Colfax municipal waterworks project, call for a $40,000 gallon steel tank and tower; one 15-horsepower oil engine, pump etc.; 2,000 feet of 8-in.; 3,000 feet of 6-in.; 600 feet of 4-in. cast iron water pipe, 12 fire hydrants, etc.; C. A. Kenney is village clerk.

DEPERE, WIS.—The Lauson-Lawton Co., gasoline engine and farm electric lighting systems, is experiencing the busiest season in its existence. Last week a single shipment of a carload of engines, 44 in number, was made to the Kontinental Kompound Co., Council Bluffs, Ia., while smaller shipments are being made daily to points in the east and southwest.

LACROSSE, WIS.—The LaCrosse Steel & Construction Co., capital $12,000, has been organized by George W. Traynor, J. F. McDonough and Fred A. Pfifer, to do a general erecting and fabricating business.

MILWAUKEE.—The Western Brass Co. has been incorporated; $25,000; by Loe E. Kennedy, Harry W. Brown, Frank H. Hannaford; Hannaford & Brown, city attorneys.

MILWAUKEE.—Herman J. Esser, architect, has awarded all contracts for the erection of a steel and concrete addition to the factories of the Harsh & Edmonds Shoe Co. at Reed and Maple streets, Milwaukee, to cost $85,000. It will be 80x160 feet in size, seven stories high. Previously noted.

MILWAUKEE.—Articles of incorporation have been filed by the Milwaukee Steel Products Co., capital stock $25,000; E. M. Dougherty, Nicholas Kies and A. R. Marggraff appear as incorporators. The concern intends to establish a shop for general engineering.

MILWAUKEE.—The general contract for reinforced concrete, mason and cement work on the $100,000 addition to St. Joseph's Convent, Layton Blvd. and Greenville avenue, was awarded to Paul Riesen's Sons, University building, Milwaukee. Brust & Phillips are architects.

MILWAUKEE.—O. H. Schultz, H. J. Scheuerbock and H. L. Kuehnel, Milwaukee, have organized the Excelsior Mixer & Machinery Co. with $25,000 capital, to manufacture power concrete mixing and hoisting machinery. Plans are being made for manufacturing facilities.

OWEN, WIS.—The E. J. Vaudreuil Canning Co. organized here with $25,000 capital, will erect a canning factory and purchase modern equipment; George N. Childs, C. N. Frawley and C. Schroeder are the incorporators.

REEDSBURG, WIS.—The Reedsburg Motor Truck Co. has been incorporated with $125,000 capital to engage in the manufacture of commercial power vehicles. Temporary quarters have been leased and equipment is now being purchased. Later it is intended to build a model factory.

SHEBOYGAN, WIS.—Walter J. Kohler, president of the J. M. Kohler Mfg. Co. Enameling works, has purchased considerable acreage and formed a townsite in Kohler, Sheboygan county, the seat of the plant and will install a waterworks and sewerage system.

SHEBOYGAN, WIS.—The C. Reiss Coal Co., Sheboygan, Wis., awarded the contract for extending its dock at Green Bay, Wis., 640 feet, to the Wisconsin Dredge & Dock Co., Sheboygan, Wis., and the contract for installing a new 582-foot bridge and new electric coal handling equipment to the Heyl & Patterson Co., Pittsburgh. About $50,000 will be expended. The storage capacity will thereby be increased to 500,000 tons.

STURGEON BAY, WIS.—F. G. Hunt, Engineer for E. E. Galle & Co., Minneapolis, Minn., promoters of an interurban railway system for Door county, Wis., has completed surveys of the proposed line and the promoters will now perfect the organization of the corporation. The survey calls for 60 to 70 pound steel, corrugated steel culverts, for about 14 miles of railway. It is planned to start actual work by fall. The W. W. Winchester Construction Co., Minneapolis, Minn., will have charge.

WATERTOWN, WIS.—The Otto Biefeld Co., machine shop and boilers, is about to award contracts for the erection and equipment of its new machine and construction shop. The investment will be in the neighborhood of $15,000. Otto Biefeld is president.

BELLEVILLE, MO.—The Alloys Metal Foundry Co. has been incorporated to conduct a foundry business; $2,500; by Wm. G. E. Rolar, Henry Rois, Hubert Hartman Jr. and Renst E. Wagelin.

KANSAS CITY, MO. — The Automatic Electric Light Co. has been incorporated; $100,000; by F. H. Wilmot, W. H. Maloney and William F. Warner.

ST. LOUIS. — The St. Louis Hardware Manufacturing Co., owned by Joseph H. Hacker, 2550 Benton street, has taken out a building Permit for a $1,200 addition to its factory.

ST. LOUIS.—The Carnegie Bridge Co. announces that it will spend $360,000 before the close of the summer in reconstructing the Carnegie bridge across the Mississippi river between Keokuk, Ia., and Hamilton, Ill.

ST. LOUIS.—Economy Range & Heater Mfg. Co. has been incorporated to manufacture and sell heating ranges, etc.; $50,000; by Max O. Hessel, William Heine and Harry R. Jones.

ALBIA, IA.—Sometime between now and November the Albia Interurban railway plans to erect 17 miles of transmission line; also by the earlier part of June to purchase a 200-kilowatt rotary converter, transformers, poles, transmission towers and necessary auxiliaries.

WATERBURY, IA.—The Waterbury Chemical Co. has purchased from Dr. Thos. Duhigg the property located at East Seventh and Locust streets as a site for its proposed factory.

HILLS, MINN.—Within the next three months the village plans to erect a power house and purchase one 50-horsepower oil engine and a 37-1/2-kilo-volt-ampere, 3-phase, 2300-volt generator with switchboard, pole line and necessary auxiliaries.

MINNEAPOLIS.—The Standard Building Corporation, 616 Northwestern Bank Bldg., has completed plans for an office building, 26 stories, 99x157 feet, of steel and tile, to cost $1,500,000.

MINNEAPOLIS.—The James Leck Co., 311 S. Seventh street, has a general contract for a building at 219 Sixth street, five stories, 44x157 feet, of brick and reinforced concrete, for the Mueller-Davis Printing Co., 213 Nicollet avenue.

THIEF RIVER FALLS, MINN.—Thief River Falls Iron Works has purchased the Northwestern Drainage Co., its shop and equipment in West Second street with all its supplies; price named, $12,000.

SOUTHERN STATES

RICHMOND, VA.—American Water Works & Electric Co. has been incorporated to own, operate, and build water and electric plants in addition to other privileges; $25,000,000; by H. Hobart Porter, New York, president; Henry H. Pierce, New York, secretary; and Charles L. Scott, Hempstead, L. I., treasurer.

EATONTON, GA.—City will vote June 8 on a $25,000 bond issue for developing waterpower at Griffin Mill on Little river and installing an electric lighting system. Address M. A. Shivers.

LAGRANGE, GA.—Lagrange Foundry & Machine Co. has been incorporated with $5,000 capital by I. N. Lozier and E. B. Clark, of Lagrange; Chas. H. Cox, West Point, Ga., et al.; the firm will erect and equip buildings.

PONCHATOULA, LA. — The Ponchatoula Veneering & Package Co. has been organized with $50,000 capital stock; actual work of building a box factory will begin within two weeks; J. L. McMaron, manager.

DALLAS, TEX.—Bids will be received until July 1 by Jarvis Hunt, 53 West Jackson boulevard, Chicago, for the union passenger station and terminals to be erected here.

ELECTRA, TEX.—Lincoln Tank Co. has been incorporated; $5,000; by W. P. Lincoln, V. M. Lee and G. C. Barkley.

VELASCO, TEX.—Plans for the railroad and wagon bridge to be built across the Brazos river at this place have been approved by the secretary of war. The bridge will be of steel, 500 feet long, including a 250-foot draw; estimated cost, $120,000.

JONESBORO, ARK. — The Jonesboro Blacksmith Co. has changed its name to the Jonesboro Machinery Co. and increased its capital stock from $6,000 to $10,000.

PARAGOULD, ARK. — City will open bids about the last of June for $30,000 worth of water works improvements to include a 100,000-gallon steel tank and mains; plans by Rollins & Westover, Kansas City, Mo.; H. O. Donaldson, city secretary.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(First half delivery.)

Bessemer, valley	$14.00
Bessemer, Pittsburgh	14.90
Basic, Pittsburgh	13.90
Basic, eastern Pa.	14.00
Malleable, Pittsburgh	14.15 to 14.40
Malleable, Chicago	14.25
Malleable, Philadelphia	15.50 to 15.75
Malleable, Buffalo	13.00 to 13.50
No. 1X Philadelphia	15.25 to 15.50
No. 2 foundry, Pittsburgh	14.15 to 14.40
No. 2 foundry, Cleveland	14.25
No. 2 foundry, Ironton	13.50
No. 2 foundry, Chicago	14.25
No. 2X foundry, Philadelphia	14.75 to 15.00
No. 2X foundry, New York	14.75 to 15.00
No. 2X foundry, Buffalo	13.00 to 13.50
No. 2 plain, Philadelphia	14.50 to 14.75
No. 2 plain, New York	14.50 to 14.75
No. 2 plain, Buffalo	13.75
No. 2 southern, Birmingham	10.50 to 11.00
No. 2 southern, Cincinnati	13.75 to 14.25
No. 2 southern, Chicago	14.85 to 15.85
No. 2 southern, Philadelphia	14.75 to 15.00
No. 2 southern, Cleveland	14.85 to 15.35
No. 2 southern, New York	14.75 to 15.25
No. 2 southern, St. Louis	14.50 to 15.00
Virginia, 2X, Philadelphia	15.30 to 15.55
Virginia, 2X, Jersey City	15.60 to 15.85
Virginia 2X, New Eng., all rail	16.20 to 16.70
Gray forge (eastern Pa.)	13.90 to 14.25
Gray forge, Pittsburgh	13.65 to 13.90
Gray forge, Birmingham	9.50 to 10.00
Silveries, 5 per cent, Cleveland	17.30 to 17.55
Silveries, 5 per cent, Birmingham	12.50
Silveries, 5 per cent, Chicago	16.85
Silveries, 8 per cent furnace	15.75 to 16.00
Standard low phos., Phila.	21.00
Lebanon low phos., furnace	17.00 to 17.50
Low phos., Pittsburgh	21.65 to 21.90
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	15.75 to 16.50
Charcoal, Buffalo	16.00 to 17.00
Charcoal, Birmingham	25.00
Middlesbrough, No. 3, Phila., ex ship	15.00 to 15.25

IRON ORE

(Lower lake ports.)

Old range Bessemer, 55 per cent	$3.75
Mesabi Bessemer, 55 per cent	3.50
Old range, non-Bes., 51½ per cent	3.00
Mesabi, non-Bessemer, 51½ per cent.	2.85

(Per unit Philadelphia.)

Foreign Bess., 50 to 65 per cent	7 to 8c
Foreign non-Bess., 50 to 65 per cent.	7 to 8c

COKE

(At the ovens.)

Connellsville furnace	$1.75 to 1.85
Connellsville fur. contr.	2.00
Connellsville foundry	2.40 to 2.65
Connellsville fdy., contr.	2.50 to 2.75
Wise county furnace	1.90 to 2.10
Wise county foundry	2.40 to 3.10
Pocahontas furnace	1.90 to 2.40
Pocahontas foundry	2.40 to 2.75
New River, foundry	2.75 to 3.50
New River, furnace	2.20 to 2.35

FERRO-ALLOYS

Ferro-manganese, Baltimore	$38.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro-silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent, Pgh.	22.90
Ferro-sil., 11 to 12 per cent, Pgh.	21.90
Ferro-sil., 10 to 11 per cent, Pgh.	20.90
Ferro-sil., 9 to 10 per cent, Pgh.	19.90
Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Bes. billets, Pbgh. and Yn.	$20.00
Open-hearth bl., Pbgh. and Yn.	20.00
Open-hearth bil., Phila.	22.40 to 23.40
Bes. sheet bars, Pbgh. and Yn.	21.00
Op.-h'th sh. bars, Pbgh. & Yn.	21.00
Forging billets, Phila.	26.40 to 27.40
Forging billets, Pittsburgh	25.00
Wire rods, Pittsburgh	26.00

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Light rails, 8 lbs., Pbgh. or Chi.	1.40c
Lgt. rails, 12 lbs., Pbgh. or Chgo.	1.35c
Lgt. rails, 16 to 20 lb., Pbgh. or Chicago	1.30c
Lgt. rails, 25 to 45 lbs., Pbgh. or Chicago	1.25c
Relaying rails, standard, Chgo.	23.00 to 24.00
Relaying rails, light, Chicago	$21.50 to 22.50
Angle bars, st. sect. Pbgh., base	1.50c
Angle bars, st., sections, Chgo.	1.50c
Spikes, railroad, Pbgh.	1.40c to 1.45c
Spikes, railroad, Chgo.	1.55c
Track bolts, Pbgh.	2.00c
Track bolts, Chgo.	2.00c

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.15c to 1.20c
Structural shapes, Chicago	1.28c to 1.33c
Structural shapes, Philadelphia	1.25c to 1.30c
Structural shapes, New York	1.26c to 1.31c
Structural shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.28c to 1.33c
Tank plates, Pittsburgh	1.10c to 1.15c
Tank plates, Philadelphia	1.25c to 1.30c
Tank plates, New York	1.26c to 1.31c
Bars, soft steel, Pittsburgh	1.15c
Bars, soft steel, Chicago	1.28c to 1.33c
Bars, soft steel, Philadelphia	1.30c to 1.35c
Bars, soft steel, New York	1.31c to 1.36c
Hoops, carloads, Pittsburgh	1.25c to 1.30c

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Baltimore	14½ cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
Minneapolis and St. Paul	32 cents
Denver	67½ cents
St. Louis	22½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, plates and shapes	80 cents

Hoops, less carloads, Pittsburgh.	1.35c
Bands, Pittsburgh	1.15c to 1.20c
Shafting, carloads, Pbgh., disc.	65 to 66
Shaft'g less carl'ds, Pbgh., disc.	62 to 63
Bar iron, Chicago	1.10c to 1.12½c
Bar iron, Philadelphia	1.20c to 1.25c
Bar iron, New York	1.25c to 1.30c
Bar iron, Cleveland	1.20c to 1.25c
Bar iron, Pittsburgh	1.30c
Hard steel bars, Chicago	1.25c to 1.30c
Smooth finish'g mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.85c to 1.90c
No. 28 black, Chicago	1.98c to 2.03c
No. 28, tin mill, black, Pbgh.	1.85c to 1.90c
No. 28, galvanized, Pbgh.	2.80c to 2.85c
No. 28, galvanized, Chgo.	2.98c to 3.03c
No. 28, cor. galv., Pbgh.	3.00c to 3.10c
No. 28, painted cor., Pbgh.	2.10c to 2.20c
No. 10, blue annealed, Pbgh.	1.35c to 1.40c
No. 10, blue annealed, Phila.	1.55c to 1.60c
Tin plate, 100 lb., coke, base	$3.40

IRON AND STEEL PIPE

(Pittsburgh.)

	Black Butt-weld.	Galv.
Steel, ⅜ to 3 inches	80	71½
Iron, ⅜ to 2½ inches	70	61
	Lap-weld.	
Steel, 2½ to 6 inches	79	70½

BOILER TUBES

Steel, 3½ to 4½ inches	72
Iron, 3½ to 4½ inches	60

WIRE PRODUCTS

Wire nails, jobbers, Pittsburgh	$1.55 to 1.60
Wire nails, retailers, Pittsburgh	1.60 to 1.65
Plain wire, jobbers, Pittsburgh	1.35 to 1.40
Plain wire, retailers, Pittsburgh	1.40 to 1.45
Galvanized wire, jobbers, Pbgh.	1.75 to 1.80
Galvanized wire, retailers, Pbgh.	1.80 to 1.85
Polished staples, Pbgh.	1.55 to 1.60
Galvanized staples, Pbgh.	1.95 to 2.00
Barb wire, painted, jobbers, Pbgh.	1.55 to 1.60
Barb wire, painted, retailers, Pbgh.	1.60 to 1.65
Barb wire, galv., retailers, Pbgh.	2.00 to 2.05
Barb wire, galv., jobbers, Pbgh.	1.95 to 2.00

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller or shorter, rolled threads, 80 and 10; cut threads, 80 and 5; larger or longer, 75 and 10.

Machine bolts with hot pressed nuts ⅜ x 4 inches, smaller or shorter, rolled, 80 and 15; cut, 80 and 10; larger or longer, 75 and 15.

Gimlet and cone point lag or coach screws, 80 and 20.

Hot pressed square, blank or tapped nuts, $6.80 off list; hot pressed hexagon blank or tapped, $7.20 off.

Cold pressed, C. & T. square, blank or tapped, $6 off; hexagon, blank or tapped, ⅜ inch and larger, $7.20; ½-inch and smaller, $7.80.

RIVETS

Structural rivets, Pbgh.	1.60c to 1.65c
Structural rivets, Chgo.	1.73c to 1.78c
Boiler rivets, Pbgh.	1.70c to 1.75c
Boiler rivets, Chgo.	1.83c to 1.88c

SCREWS

(New York.)

Lag, gimlet and cone point	80 and 20
Coach, gimlet point	80
Standard jack	70 and 10
Mch., cut thread, flat head	50 and 10
Mach., cut thread, round head	50 and 10 and 10
Mch., cut thread, fillister hd.	40 and 40 and 10
Mch., rolled thread, flat head or round head	80 and 10
Set screws, iron	75 and 10 and 10
Set screws, steel, per cent advance over iron	25
Square head cap screws	70 and 10 and 10
Hexagon head cap screws	70 and 10 and 10
Fillister head cap screws	60 and 10 and 10
Flat head wood screws	10 and 10 and 5
Round head wood screws	10 and 10 and 5

WASHERS

(Discounts, Iron or Steel, to Jobbers, Cleveland.)

⅛-inch	$7.25
⅜-inch	7.00
½-inch	7.00
⅝-inch	7.00
¾-inch	7.00

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

TWISTED REINFORCING BARS

(Soft steel, Pittsburgh mill.)

¾-inch and larger	1.25c
⅝-inch	1.30c
½-inch	1.35c
⅜-inch	1.50c
¼-inch	1.75c